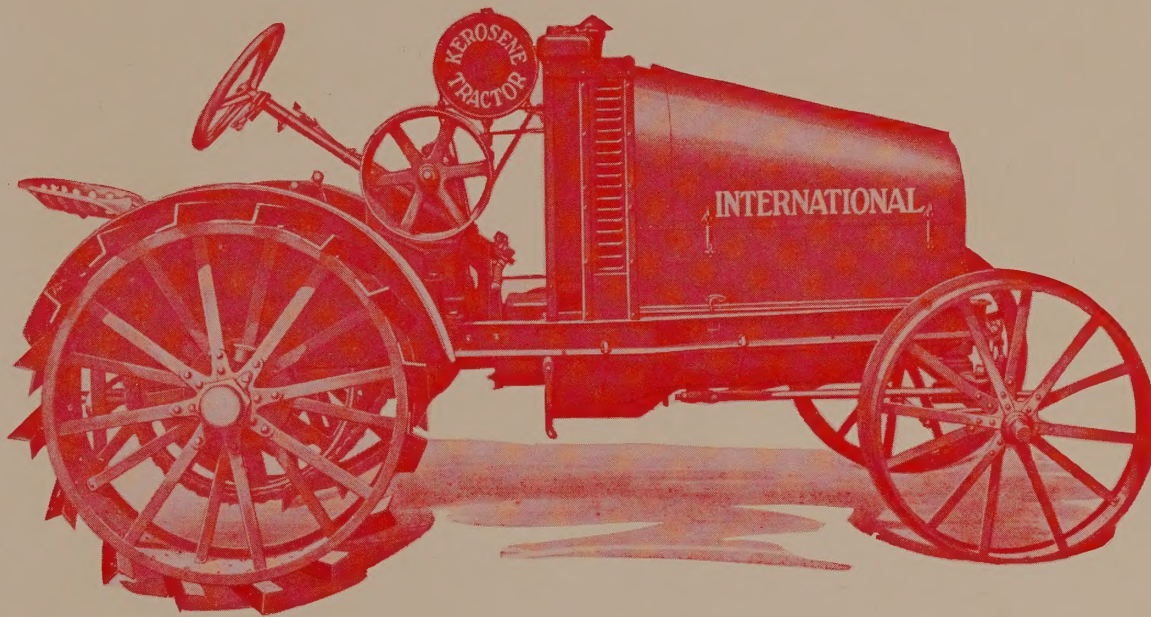
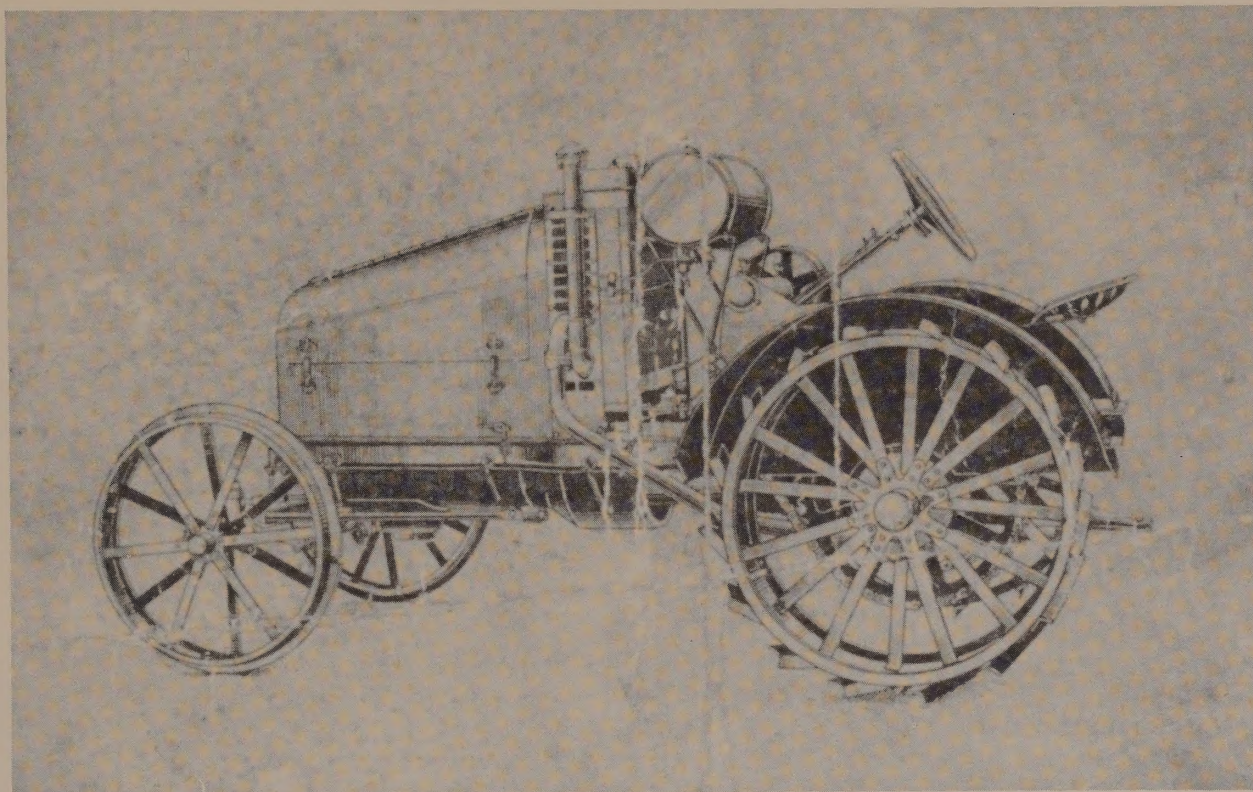


Evolution OF A TRACTOR



8-16 International Kerosene Tractor

*A 1920 Reminiscence By Executives
Of The International Harvester Company*



Publisher's Introduction

It has indeed been a pleasure to be a part of this project of publishing this book. I was so pleased when LeRoy Baumgardner approached us some months ago regarding the rare manuscript that he had acquired for his collection. We were enthusiastic from the start, as we felt publication of the text and photos would give tractor fans new insights on IHC company history and product development. The original pictures are remarkable, and we hope they will be enjoyed.

Working with LeRoy was most rewarding and we are glad that he saw fit to share this treasure with others. We have done virtually no editing to the manuscript, leaving it essentially as it was written. Mr. Baumgardner supplied text for the captions.

Linda Sharron
Stemgas Publishing Co.

Published 1988 by
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ROCKFORD, ILLINOIS



PREFACE

All the material used in this book is from my private collection. This includes all the pictures, of which the ones taken at the factory are being reproduced for the first time.

This book, entitled *Evolution of a Tractor*, is a group of recollections faithfully recorded in April 1920 by engineers and supervisors of the International Harvester Company. The demand for large tractors was winding down and farmers were looking for tractors suited to small acreage farms. In 1920 the newest tractor in the IHC product line was the International 8-16. The row crop Farmall was still a dream waiting to be realized. There is a brief mention made in the book of some experiments being done on a machine that hopefully will become an all-purpose tractor called the Farmall.

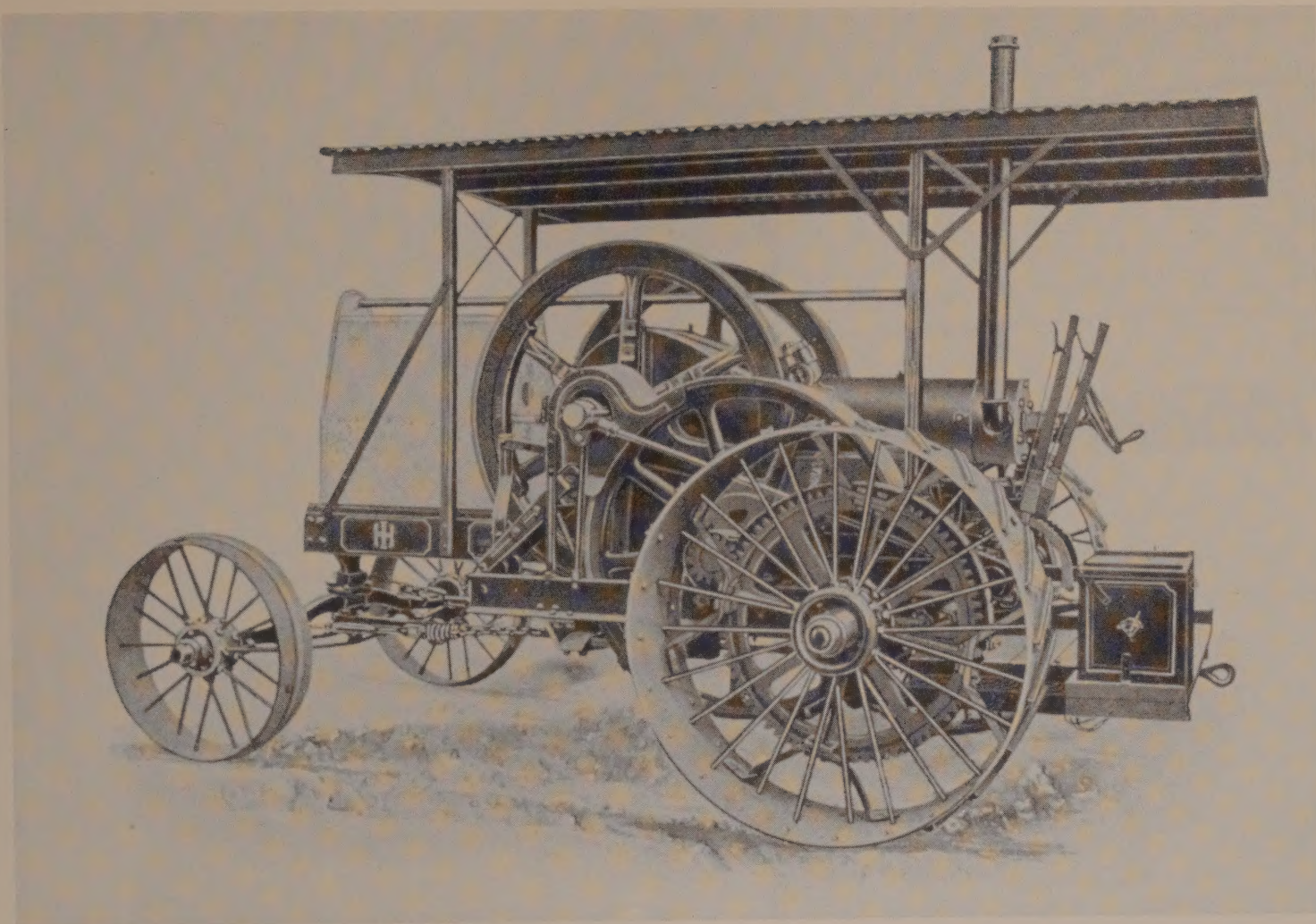
It is my hope that this book will be an informative and pleasurable reading experience.

Without the help of Linda Sharron and her staff at the *Gas Engine Magazine* this book would not have been possible. Many thanks to all those that helped.

Any comments may be addressed to: LeRoy A. Baumgardner, Jr., P.O. Box 1313, Hanover, PA 17331.

LeRoy A. Baumgardner, Jr.
October 1987

International Harvester Co.
tractor works, Chicago,
Illinois, 1919.



RECOLLECTION

(With apologies to Hitchcock et al.)

THE EVOLUTION OF A TRACTOR

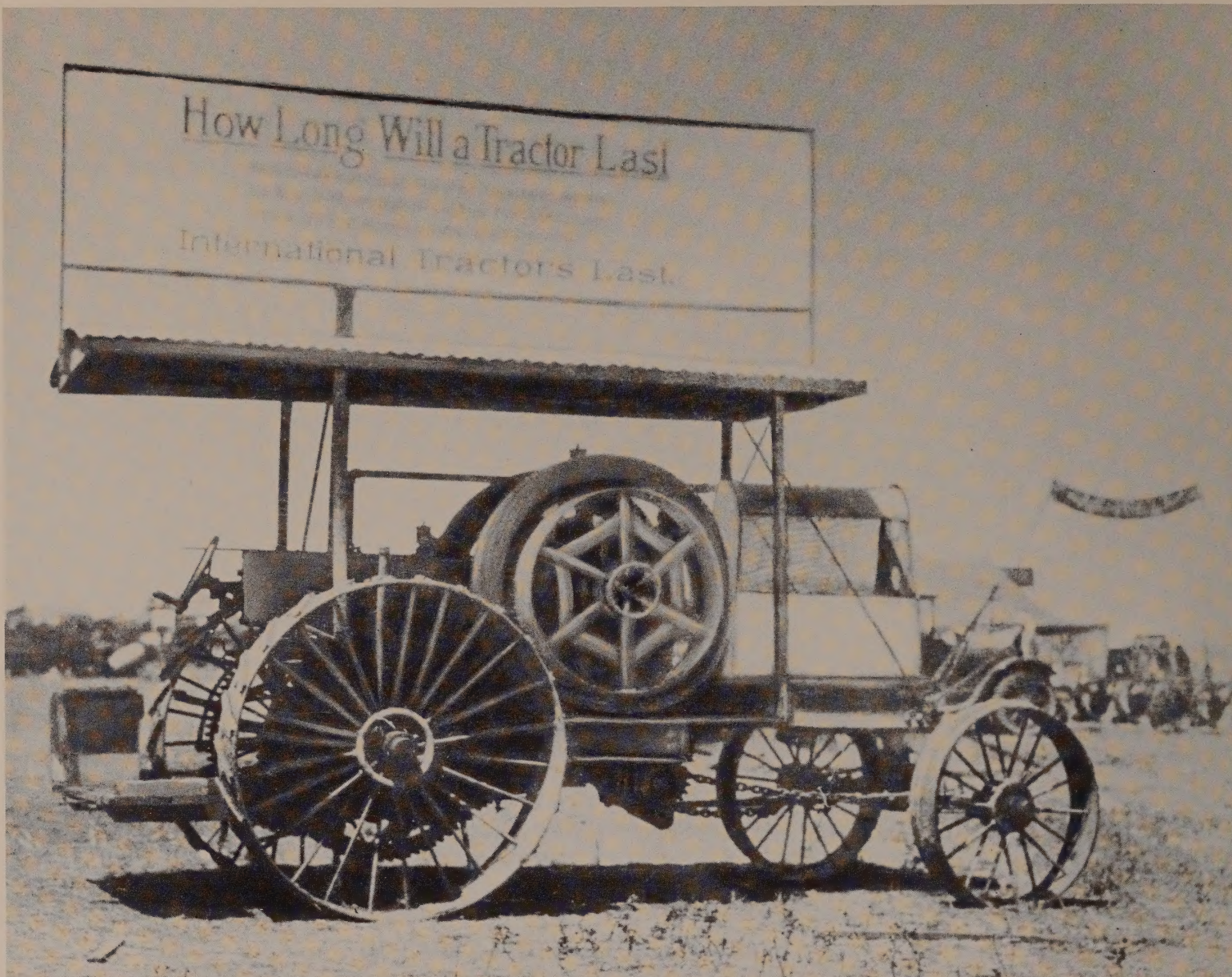
*When time has picked you up as a friend,
And age comes on to stay,
There's nothing so good as to recollect,
What happened yesterday.*

*And through our recollections come,
The memory full of joy,
When long ago was "Tractor" born,
And all thought it a toy.*

*But time has flown, the years have passed,
You know it's stood the test.
And now the International,
Is not "as good" but "BEST".*

*So recollect some more Old Pals,
Your memories are good,
And prove to all the world you know,
The "Tractor could" and "would".*

This illustration from a 1908 sales catalog shows the production model friction drive tractor. These tractors were available in 10, 12, 15, and 20 HP sizes. Two of the big selling points for these tractors were: no chance of boiler explosion or fire and you didn't need a licensed engineer as with a steam engine.



RECOLLECTION

E. A. JOHNSTON

Manager, Experimental Department

Recollects That:

International Harvester Co. made extensive use of placing their equipment at county fairs and other exhibits so that farmers could get a hands-on look at their products. Pictured here is an early Type A IHC tractor at one of these events.

On or about the year 1906 or 1907, the Company entered into agreement with the Ohio Manufacturing Company of Upper Sandusky, Ohio, whereby this company supplied its regular horizontal single cylinder stationary engine to the Ohio Manufacturing Company to be mounted on a truck manufactured by them and marketed the complete product. This tractor was known as Type "A" made in 10 HP, 12 HP, 15 HP, and 20 HP, and the power was transmitted from the engine to the drive wheels through friction and gear wheels.

In the year 1907, in order to meet the demand the manufacture of this tractor was also taken on at Akron Works and Mr. H. B. Morrow was in charge of the Tractor Department.

Also, in the year 1907, the Akron Works Experimental Department then located at the McCormick Works, built up and tested a light four cylinder tractor, but after experimenting with this tractor for sometime it was decided that the tractor was too light and the trade was not ready for a tractor of this type.

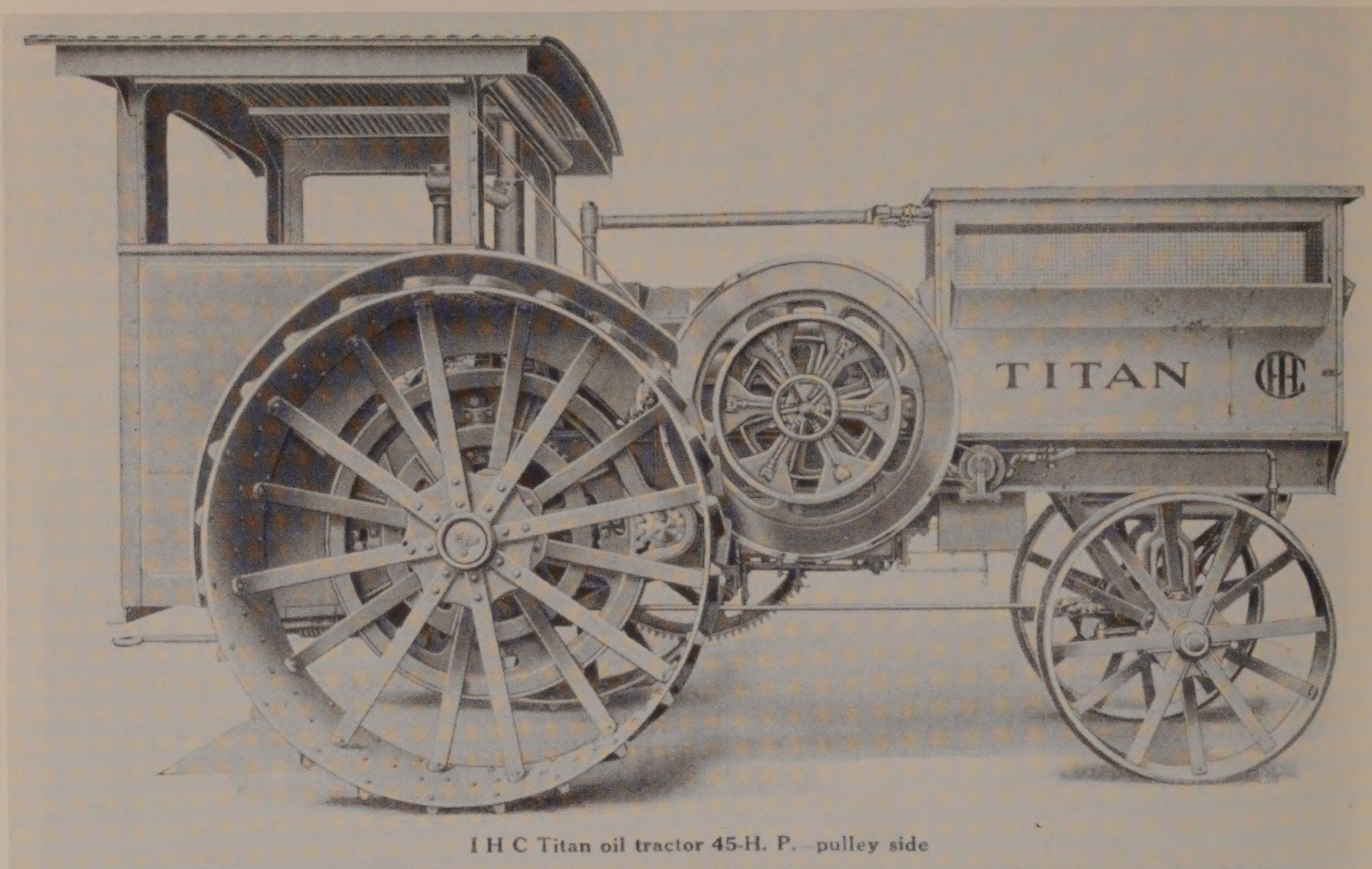


Experience with the Type "A" tractor indicated that a more satisfactory transmission was desirable and in the year 1908 the Ohio Manufacturing Company developed a gear and chain transmission to replace the friction. This tractor was known as Type "B".

About the same time the Experimental Department at Akron Works designed and developed a tractor using a regular horizontal single cylinder engine with full gear transmission, known as the Type "C". This tractor was built in 20 HP and 25 HP sizes at Akron and later in the year of 1909 or 1910, the manufacture of this tractor was transferred to the Milwaukee Works.

In 1908 the Akron Works Experimental Department designed what was known as the Mogul 45 HP Tractor, with a two cylinder opposed motor, gear transmission, and friction reverse. The manufacture of this tractor was started in a small way in the small plant located on Blue Island Avenue in front of the McCormick Works in the year 1910. About this same time Milwaukee Works Experimental Department designed and developed what was known as the Type "B" Tractor, using the regular single cylinder horizontal engine which was built in 20 HP and 25 HP sizes at the Milwaukee Works.

A new threshing rig being delivered. Rig consists of a Type B 20 HP tractor and New Racine thresher. Photo was taken in about 1911 near Eau Claire, Wisconsin.

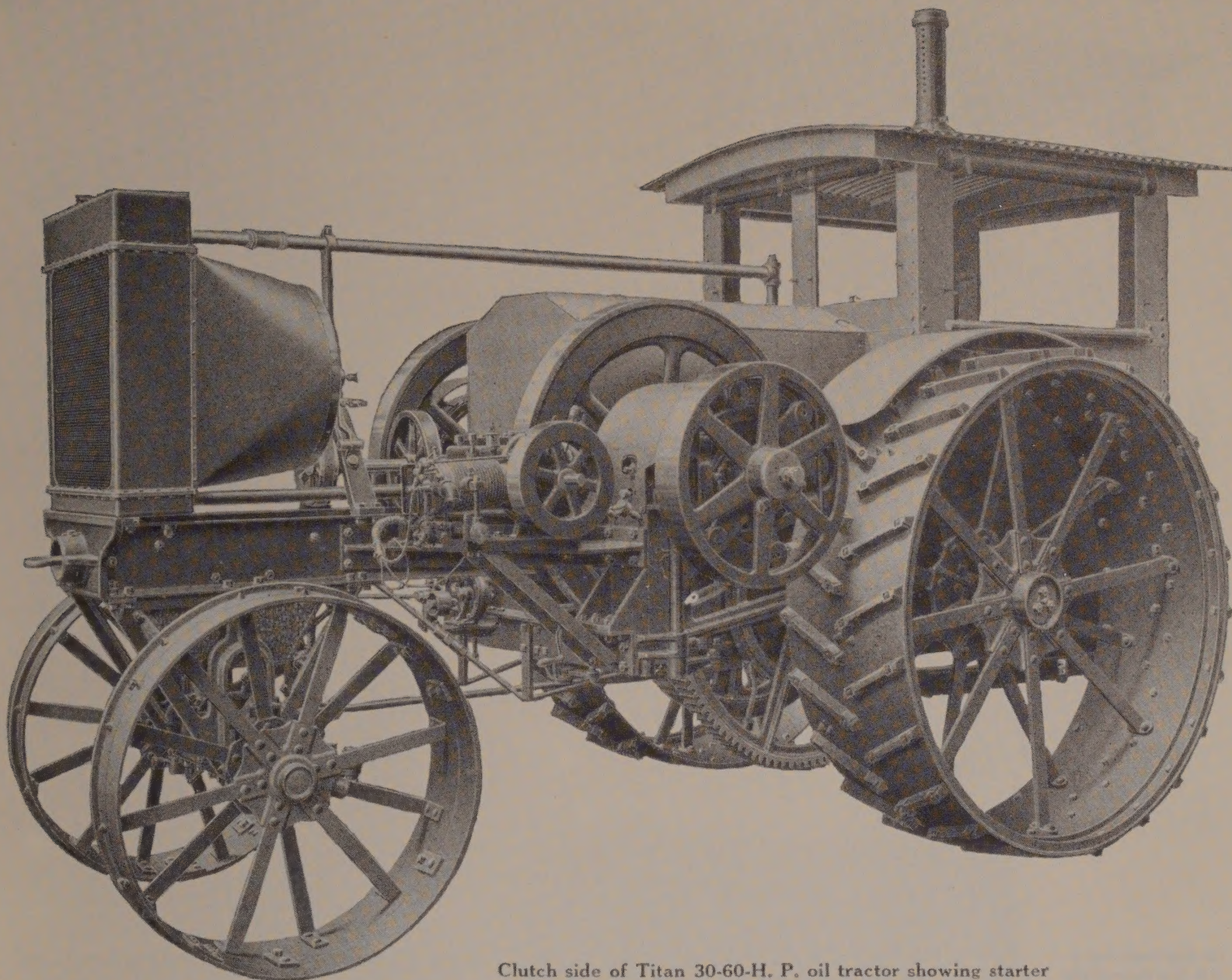


I H C Titan oil tractor 45-H. P.—pulley side

Titan 45 HP tractor. These huge tractors were intended for drawbar work of the heaviest kind. The 45 HP Titan was built from 1910-1912. It was upgraded in 1913 and became the 30-60 Titan.

A little later the Milwaukee Works Experimental Department designed what was known as the Titan 45 HP Tractor which was equipped with a two cylinder twin engine, gear transmission, and air starter. This tractor was manufactured at the Milwaukee Works. There was a persistent demand for more powerful tractors and to meet this demand the Milwaukee Works Experimental Department designed the 30/60 HP Titan and the Tractor Works Experimental Department developed the 30/60 HP Mogul. A few years later the Tractor Works Experimental Department

designed a single cylinder tractor along the same general lines as the 30/60 Mogul, except that a single cylinder engine was used, this tractor being known as the 15/30 HP Mogul, and at about the same time the Milwaukee Works Experimental Department designed what was known as the Titan 18/35 HP which was along the same general line as the Titan 30/60. The Tractor Works Experimental Department also designed and developed a tractor with a two cylinder opposed motor which was known as the 12/25 HP Mogul.



Clutch side of Titan 30-60-H. P. oil tractor showing starter

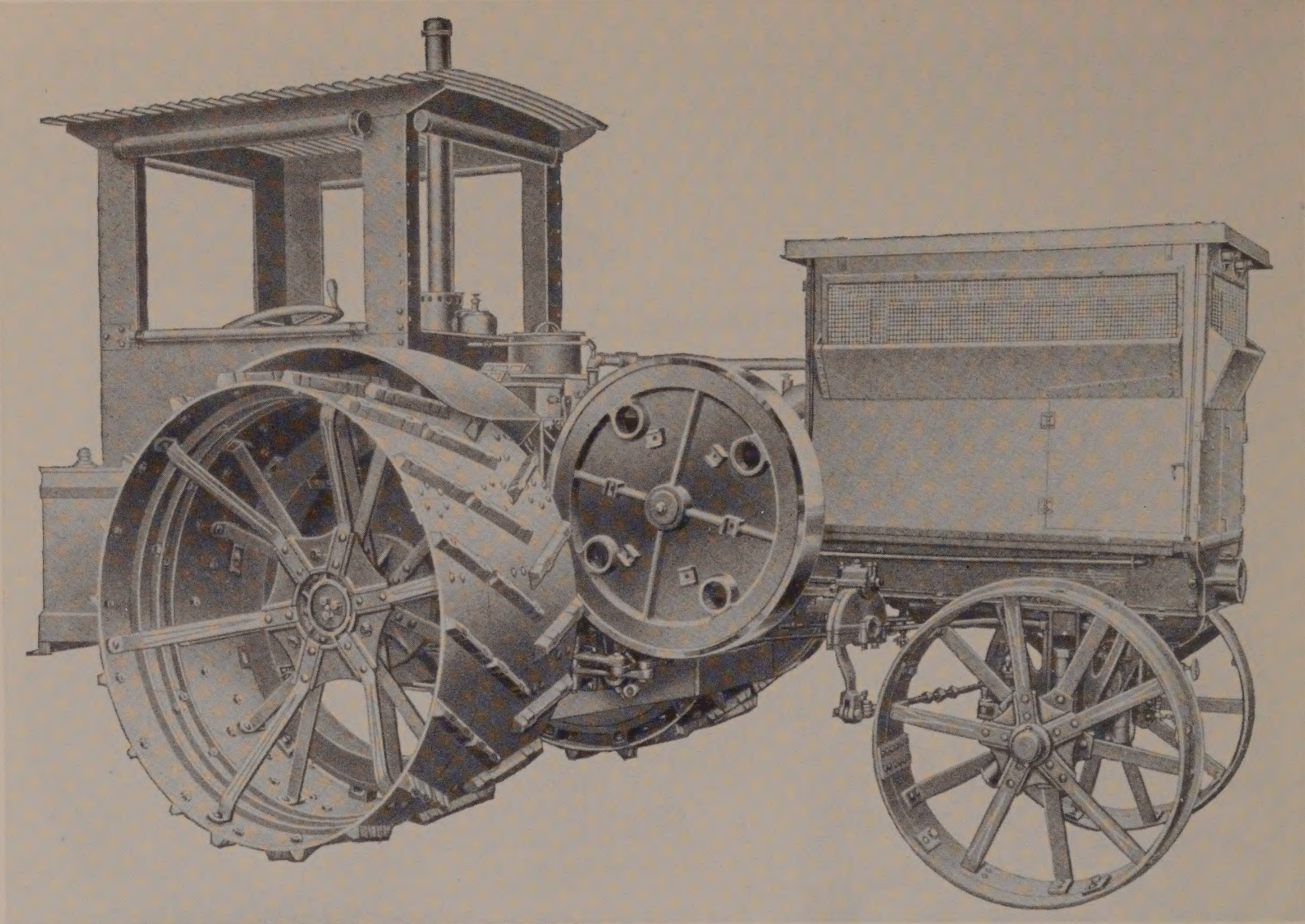
About the year 1913 or 1914 the Tractor Works Experimental Department designed and developed a 20/40 HP Tractor with a four cylinder horizontal engine mounted directly on the transmission case, which case also was the frame of the Tractor. As near as could be determined by the records, this was the first tractor of this general construction which is now used by Ford, Sampson(sic), Twin City and others, but about this time the demand for large tractors decreased and only 10 of these were manufactured, and the Tractor Works Experimental Department designed and developed the 8/16 Mogul, two plow tractor which proved to be very popular and successful.

About the same time the light four cylinder tractor now known as the 8/16 International was designed.

About this time the Milwaukee Works Experimental Department designed what was known as the Titan 12/25 HP which was later redesigned and is now known as the 15/30 International. A little later on the Milwaukee Works also designed the 10/20 HP Titan, three plow Tractor which is now very popular and successful.

The bore of the 8/16 Mogul was enlarged and with the addition of a two speed transmission to make it a three plow tractor, became known as the 10-20 Mogul the manufacture of which was discontinued in the year 1918, on account of the popular demand for the Multi-Cylinder Engine.

The 30-60 Titan pictured here is one of the last 30-60's to be built. The large cooling tank used on the early Titan 45's and 30-60's has been replaced with a radiator and several other small changes were made.



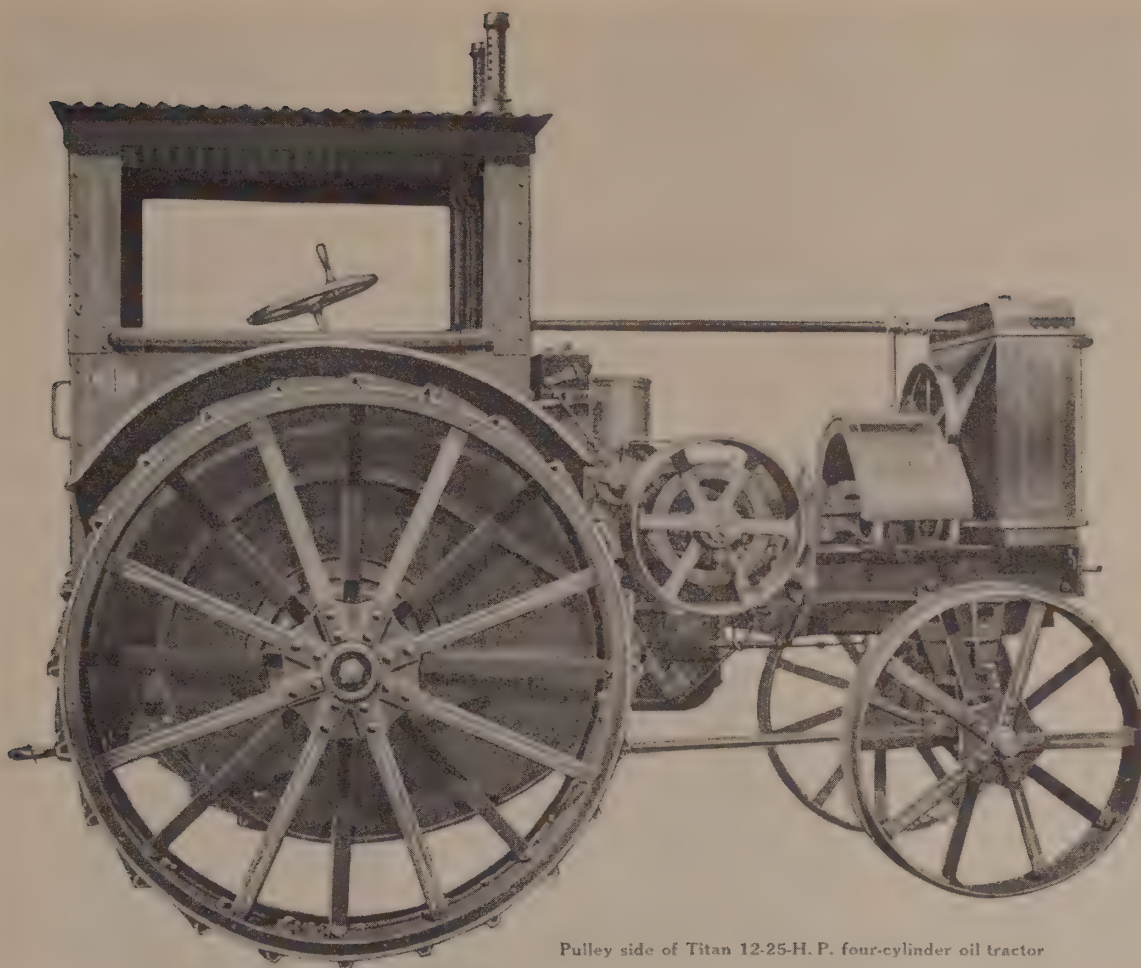
H. B. MORROW
Superintendent, Tractor Works
Recollects That:

This picture taken from a 1915 Titan tractor catalog shows the very rare 18-35 Titan. Only a very few of these tractors were ever built.

The Harvester Company's entrance into the tractor industry dates back to the latter part of 1907, when the writer started the work of making a friction drive Tractor, using a Milwaukee Single Cylinder Horizontal engine, mounting same on a Koun or Morton truck, as made by the Ohio Manufacturing Company, at Upper Sandusky, Ohio. Prior to this Mr. E. A. Johnston had conducted numerous tests and experiments along this line, mention of which will be made later in this article.

The Akron Tractor was turned out in considerable numbers, using what is now part of the Akron Forge Shop, Test Room and Heat Treating Departments for the purpose. The first engines built were 10 HP, 12 HP, 15 HP, and 20 HP respectively. The friction drive Tractor was built with a countershaft, the differential being part of this assembly. Power was transmitted to the truck through a 12" paper friction pulley, keyed on an extended end of the engine crankshaft and by moving the engine

rearward by means of a lever and on rollers placed on the channels, this friction wheel was brought in contact with the 50" wheel mentioned above, and thus through pinions on the countershaft and bull gears in the rear wheel gave the Tractor forward movement. To reverse this movement or move the tractor backward (the engine running in the same direction) the engine was left in the forward position and by means of another lever a small idling pulley was brought into contact with the pulley on the crankshaft and the 50" cast iron pulley simultaneously. This type of Tractor had its objections and the low wheel gear drive Tractor was started and after having been made in limited quantities was abandoned and one with larger wheels was started. Both of these gear driven tractors gave good service and were made in considerable numbers.



Pulley side of Titan 12-25-H. P. four-cylinder oil tractor

This illustration taken from a 1915 catalog shows the Titan 12-25. The 12-25 was built from 1914-1915. It was upgraded in 1915 and became known as the International 15-30.



Mogul 10-20 coming from warehouse. When International shipped its tractors, it was a common practice to attach a sign as shown for advertisement while the train was enroute.



45 HP IHC Mogul two cylinder opposed doing brake test in July 1911 at Winnipeg Motor Contest. Photo from *Gas Engine Age*, Winnipeg, September issue 1911.

During this time Mr. Johnston perfected what was our first Chicago made Tractor, the two cylinder opposed 45 HP machine. It was then decided by the management to go into the Tractor business extensively and plans made accordingly to transfer the work to Chicago.

Following this program, Mr. Johnston was given charge of the work and came to Chicago on January 30th, 1910 to start the work, bringing with him the writer C. I. Longenecker, Ralph Wilkenson, Roy Johnston, Earl C. Lutz, Ausut Ostling, Louie Verdsy, Oscar Meyher, and L. J. Forster.

The building to be used for the work was part of the McCormick Plant on Blue Island Avenue and is now used as a garage. The plans were to build 25 of the two cylinder opposed 45 HP Tractors in 1910 and to make up such tools as necessary to start manufacture in a small way in 1911.

On arrival at the little shop on Blue Island Ave., we found a 35 HP motor already installed, together with some line shaft, eight (8) old lathes and an old shaper. A small room on the west side of the building was enclosed for use as a drafting room. A small office was already in the building. The building was cleared of all rubbish, etc., and three of the old lathes, a new one, and a new shaper were running on Saturday, February 5th, 1910. The official name "TRACTOR WORKS" was decided upon on Wednesday, February 10th, 1910. The office furniture came in on February

2nd, and consisted of two (2) roll top desks, a typewriter desk and a No. 10 Remington Typewriter. Small tools were ordered and began coming in about this time.

On Thursday, February 3rd, 1910, Mr. Johnston and the writer visited the site of the present Tractor Works and watched the surveyors locate the first stakes for the buildings.

Thor Waharmon was the first person hired in Chicago and started as a laborer and helper.

There being no door in front of the building large enough to admit a tractor, a door 12' x 12' was cut into the Blue Island Avenue side of the shop. The building of a five ton I-beam crane, equipped with a three ton Yale & Towne chain hoist was the first work performed, this crane being necessary for handling the large castings. Our first car of castings reached us from Akron Works Foundry on Saturday, February 5th, 1910.

Mr. Claus Ohlin was given charge of assembling the first engines and Mr. Homer C. Wells had charge of the building of the frames and mounting of engines, and later on the building of the frames was handled by Robert Henderson, Mr. Wells doing the mounting only.

The new plant on the boulevard was started immediately and the purchase of equipment for same carried along with it and on December 12, 1910, the first machine, a 48" Planer was started in the new plant on sub-bases for the test floor.



The first building erected at the Tractor Works consisted of one unit of the present main Machine Shop and was 250' long with galleries along the sides. The front of this building on the first floor was used for offices, drafting room, and store room. The second building was one unit of the present Forge Shop Building, and was 250' x 120'. The first engines built at the new plant were assembled under the east gallery of the Machine Shop, tested there and mounted in the Forge Shop

Building. The painting of the tractors was done in an open side shed standing about where the present Paint Shop now stands. Several units of the East Warehouse Building were next built and gradually added to until it reached its present size.

The next building activity consisted of extending the Machine and Forge Shop buildings 250' each further north. The next Building erected was one unit of the present West Warehouse Building and this building was gradually added to until it reached its present size.



On account of not being able to get enough exhaust steam from McCormick Works to heat the Plant, it was necessary for us to install a boiler for heating purposes and a second hand 400 HP boiler and stack were obtained from McCormick Works and erected east of the Forge Shop.

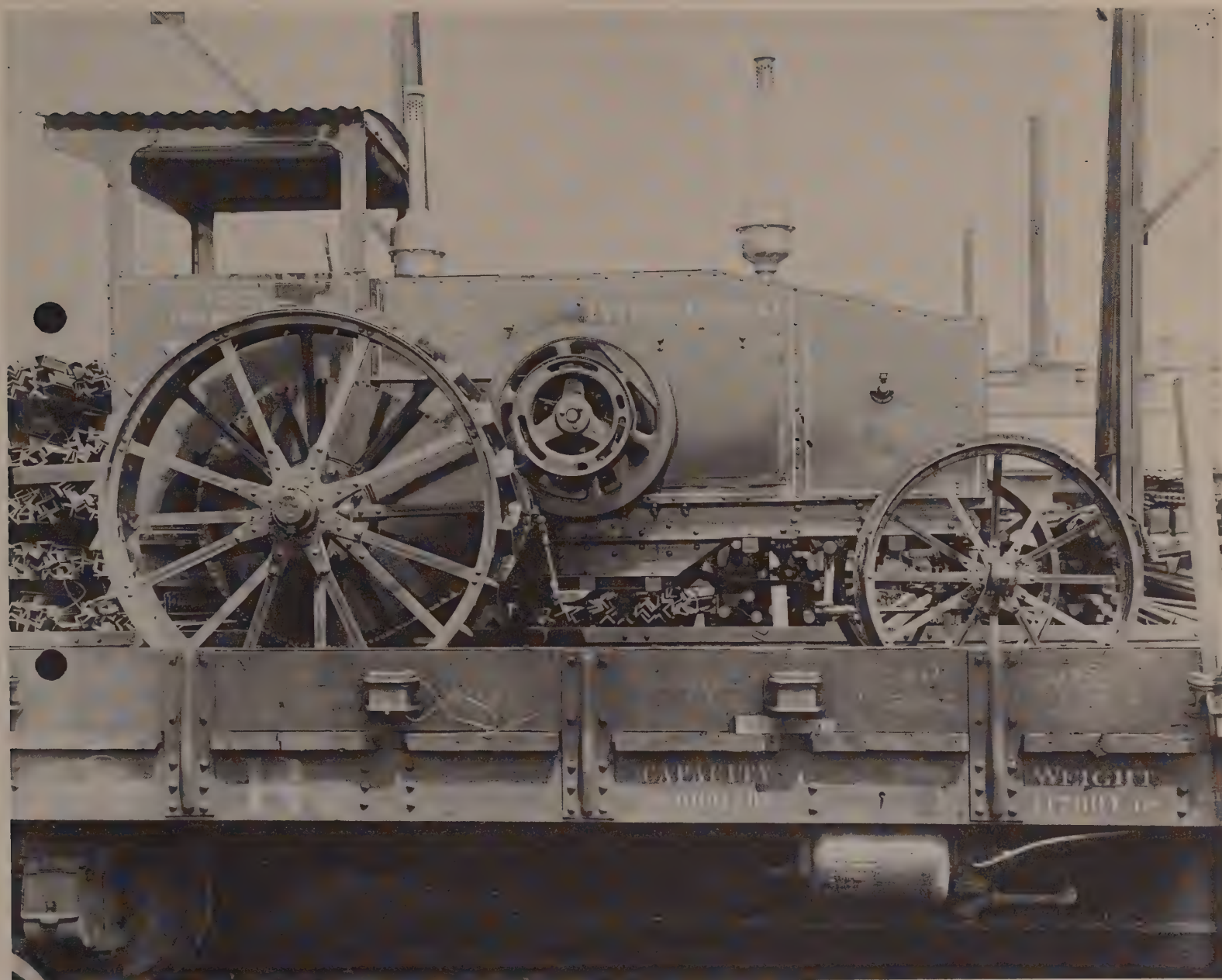
At the time of building the Plant and owing to the fact that it is located on an island, and there being no city water on the island, it was necessary to drill a deep well and at about 1700' good water in sufficient quantity was found.

At this time the tractor business had assumed considerable proportion and we were building the 45 HP machines and also a single cylinder 25 HP machine and in order to test them properly a test track was built at the north end of the plant, graded with lime-stone, etc. This track achieved considerable notoriety and was made the subject of a great deal of advertising.

Test track in Chicago where Mogul tractors were tested. Notice tractors not yet complete were pulled around for weight during the test.



Machine shop at tractor works where crankcases are machined for Mogul tractors and engines.



The Tractor business being a seasonable industry, it became necessary to design a line of stationary engines to fill in between Tractor seasons and this was done and great quantities of engines ranging from 1 HP to 50 HP both inclusive were built. It was also found necessary to change the 45 HP to a 60 HP engine and the 25 HP to a 30 HP both of which were done and manufacture continued.

About this time the demand came for a still smaller tractor and the 12/25 HP 2-Cylinder Opposed Tractor was designed and manufacture commenced. For some unexplainable reason the trend of sales indicated smaller rather than larger machines and the 8/16 Single Cylinder Tractor was then designed and built, it being later changed to a two-speed 10/20 HP tractor an after several successful seasons, both were abandoned and the Four Cylinder 8/16 was designed and manufactured instead.

12-25 Mogul tractor loaded and ready to be shipped.



I-21664



Cyrus McCormick, Jr. pouring first iron melted at the new tractor works foundry November 25, 1919. Up until this foundry was built, the castings for tractors and engines came from wherever IHC could obtain them. Some castings were even made at the Reaper works.



Plaques poured by Cyrus McCormick, Jr. during the opening of the new foundry.

Owing to the demand for the 10/20 Titan Tractor as built at Milwaukee Works having become so great in 1918, it was necessary for them to transfer what was then known as the 15/30 Titan Tractor to this Works and after a few modifications were made on same, it became known as the 15-30 International.

It was decided in 1917 to install steam hammers at this works for the purpose of making forgings and the present installation of five hammers was made. This necessitated more boiler capacity and a power plant of sufficient size to install four 500 HP boilers was built and one boiler installed. Later on another one was added and finally

another was installed, leaving at this date, May 1919, room for the future installation of a fourth boiler. The boilers are all Edgemoors—500 HP each and all equipped with LeClede-Christy chain grates.

It was decided in the latter part of 1917 to erect a six story manufacturing building just west of the Machine Shop building and east of the West Warehouse Building. This new building was completed about the middle of 1918. About this time it was decided to build a Foundry and work was accordingly started, the Foundry being officially opened on November 25, 1919.



J. D. McCANN
Assistant Superintendent
Recollects That:

The start of the Tractor Works was early in 1910, in a little one story building on 26th Street. One of the first problems to solve was to plan layout of about five small engine lathes and some small drill presses and grinder, and in most cases these were obtained out of the scrap machine pile at McCormick Works.

The first real tool outside of a couple of 4'0" Gang Radial Drill Presses, was a 60" Boring Mill for turning and finishing flywheels. Next came a large 36" x 12' Engine Lathe for crankshafts, which was followed by a 36" x 36" x 12' Planer for the Crankcases.

Conditions around the building as to doors and unloading facilities was such that it was necessary to skid these machines off the cars and drag them around building to their resting place, a distance of about 500 feet, as there was only one large door in the front of the building. Later came the Bullard Mill which we considered at that time one of the most all around tools in existence. These

tools were so crowded, one could hardly move around to advantage.

The Drafting Room for Experimental and Engineering Departments was so small and crowded, that it was necessary for two draftsmen to work on one drawing board.

During the cold weather of 1910, heat for this building was furnished by a small heating boiler and one minute we were roasting and the next minute we froze, and for a time everybody assumed he was the fireman.

Then came the problem of building the large wheels for the old 45 HP - Two Cylinder Tractors. The first thing was to locate a space to build these wheels, which was finally located in a sisal storage shed, from which the sisal had just been removed for making twine for the coming summer. A drill press was purchased to drill spoke and cleat holes and a large roll to roll the tires. To provide means to handle these tires and wheels, which were large and awkward, a chain hoist was installed in the roof of the shed after it had been strengthened to carry the load.

Mogul 45 at tractor works. Note other Mogul tractors loaded on rail cars ready for shipment.

All the spokes and rivets were riveted by hand or with pneumatic rivet hammer which compared with present gang punching and hydraulic riveting was very crude and tiresome. To obtain air for the hammer it was necessary to pipe same from the Twine Mill about one half block away and extend pipe line over a street.

In the same shed I recollect Mr. Johnston and Mr. Baker with a pattern maker from McCormick Works, building out of wood, which was afterwards made of sheet steel, the first cab in connection with the old 45 HP Tractor.

As Spring came with the necessity of increasing production (which I believe was at that time one a week) to one a day, a large tent was erected at the side of the one story building and a large "A" frame to support I-beam and chain hoist to aid in erecting and this lasted until the new Plant was ready in Fall.

Not having the fine crane and platform facilities that we were providing at the present plant for loading, it was quite a task to load these large machines on the flat cars. This was accomplished by building an incline and supporting it well underneath and run a tractor up on it by its own power, which was generally done by Mr. Morrow.

While at this location the first tractor for foreign shipment was packed, and its parts were so heavy it was the judgement of all at that time that heavy timber and boxing was necessary, and I believe the weight of the crating was equal to the weight of the Tractor itself. We packed about one in two months here as compared with six per day of this size tractor, later, when established in present plant, and when foreign business reached fifteen 10-20's per day at about the start of the World War and first year of same.

The present plant was started in February 1910, the place being at that time one large lake, and it was necessary to row out in a boat and start sewers at river and drain the land as sewer was laid. Its location presented several problems, it being on an island, with the Chicago River on one side and Drainage Canal on the other with no facilities for drinking water or gas, it was necessary to sink a well 1700 feet deep and install a gas producer, but during the last two years, both of these commodities have been supplied us by the city.

One half of the present machine and forge shop buildings were the first to be built and first tools to be installed and started were a 42" Planer and a 60" Boring Mill, about the first week in December 1910. Power to run these machines was supplied by one of the 45 HP tractors, being run in the Forge Shop Building and belted to a generator on the new test floor.

The Plant was equipped and planned for three 45 HP 2-Cylinder Gasoline Tractors per day and by the time tools were set, demand called for six (6) per day which schedule was lived up to by putting on a night crew. In 1911 by extending machine shop building and erecting Storage and Painting Warehouse Building, and adding equipment, provision was made for six per day, but by the time these tools were in action the demand had increased to twelve per day and before 1912 closed, with addition of second half of Forge Shop and another unit of Warehouse Building, this equipment was turning them out at fourteen per day.

During this period from 1910 to 1912, the 45 HP 2-Cylinder Gasoline Tractor developed into a 45 HP 2-Cylinder Kerosene Tractor and a 10-20 and 15-30 HP kerosene single cylinder tractor was produced as well as kerosene 25 HP and 50 HP stationary engines for electric lighting plants to be used in small towns.

Near the close of 1912 the demand for a slightly larger tractor caused the manufacturing of the 30/60 2-Cylinder Kerosene Tractor in place of the old 45 HP. In the beginning of 1913 a line of six sizes of sideshaft 4 to 15 HP single cylinder engines as well as three small size engines, 1, 1¼, and 2½ HP were manufactured. About March 1914 as the demand turned toward the smaller size tractor the 12-25 HP 2-cylinder Kerosene Tractors were started, to be followed by the single cylinder 8-16 Tractor in September of the same year. In August 1916, this was changed to a 10-20 and manufacture of present 8-16 four-cylinder was started.

To handle these different types of tractors and engines during 1913 and 1916, three more additions were made to the West Warehouse and main power plant started to operate forging hammers.

All possible economies in engineering had been used. As the plant was located near McCormick Works Malleable Foundry, as a source of electric power, waste heat boilers were installed and connected with Malleable furnaces, so heat after melting iron passed through boilers and generated steam which was used to drive turbine generators, making all our electric power, and the exhaust from these turbines was still further used by passing into our heating system for heating buildings, but as the Plant increased in size, and as there was plenty of electric power, we lacked steam for heating purposes, and as steam hammers were needed to make forgings, five of these were installed with the new boiler plant, and the steam after doing the necessary work in the hammers was allowed to enter the heating system to add to the steam for heating we were getting from McCormick Malleable. All of the hot water used in wash stands throughout the plant was obtained from waste heat at carbonizing and other furnaces.

When engines are first built they are hard to turn over and are stiff and to help remedy this the engine is connected to a motor in such a manner that after the motor wears engine in, kerosene can

be turned on in engine and it drives motor instead of being driven, making a generator out of it, and supplies power to help run the shop tools and at the same time acts as a brake on testing engine.

Nine fast travelling electric cranes handle large castings from cars into shop onto machines and finally to erecting and testing floors and last of all to load finished tractors onto cars.

The large machine tools are all motor driven while medium and small sizes are in groups driven off of line shafts which are all equipped with roller bearings and steel pulleys.

To transport material through the plant, nine electric driven elevating platform trucks are used, thus eliminating practically all hand trucking.

As the pressures of the war increased the demand for Tractors, additional floor space was required, so that the six story concrete building was started, and later in 1918 a new foundry, covering practically four acres of ground and equipped with the most modern facilities for making and handling castings was erected.

As the plant is located, the nearest possible place to eat being about three-quarters of a mile away, and due to land in vicinity being either occupied by railroad, drainage canal or river, it was necessary to provide men in the plant who were unable to carry lunch, a suitable place to eat, and a lunch counter type of restaurant was provided to handle about 100 men at lunch time and as the plant grew, to relieve congestion in lunch room, four stations distributed throughout the plant, where soup, coffee, sandwiches and pie were sold, were installed. These stations handle about 350 men. At present and in addition to these stations, there is under construction, a modern type of lunch room to be operated on the cafeteria plan and figured to serve 500 men, with provision made so that it can be increased to handle 750 if necessary.

The Plant starting in 1910 with 77,000 square feet of floor space, has today a total of 675,000 or approximately 15½ acres. Starting with 45 HP per day, has increased to a capacity of 2000 HP per day.

C. N. HOSTETTER
Superintendent,
Experimental Dept.
Recollects That:

My first experience with tractors was in the Spring and Summer of 1909. Prior to that time I had been employed building 4" x 5" motors for Auto Buggies.

When the first cylinder casting came in for the Tractor Motor with a 10" bore, it looked larger than the entire auto-buggy to me. Of course, all the machine tools at Akron were bought for small work and when we started large tractors we had to go outside for the machine work. I was sent out to find a place and at Mr. Lee's suggestion, went to the Welver-Seaver-Morgan Company and this firm did all of our large experimental machine work until we came to Chicago. Two of the first parts finished were the cylinder and cylinder head. We bolted the head to the cylinder and tested it to see if it would leak. It did. Our next step was to grind the two together. After trying for nearly a week to make a tight job we gave it up and grooved the cylinder and cylinder head and used a piece of soft copper for a gasket. After using the one piece copper gasket for a time, we later adopted the copper asbestos gasket.

While we were designing and building this new tractor we also took over the pattern and samples of what became the Type "B" Tractor from the Ohio Manufacturing Company at Upper Sandusky, Ohio.

As there were no drawings we started to make up a set of samples. The gears had been made to fit where they belonged and were not made to any standard pitch or pitch diameter. When we made the drawings we used the nearest standard pitch. When these new gears made to the drawings came through, Mr. Morrow who had charge of the tractor division had some mighty fine problems to solve. Some of the gears could not be driven into place and on the others the teeth did not touch. After several days of worrying there came a conference between Mr. Johnston, Mr. Morrow and Mr. Stewart, and it was decided to make a layout and make gears and parts to match and do away with the samples.

Mr. Huff was hired and under Mr. Johnston's supervision and Mr. Morrow's direction a set of drawings were made and Mr. Morrow built the first tractor to a drawing. From this time on all tractors and tractor parts were made to drawing.

The development of our tractor was really the development of individual pieces. Take for example the bull gear. First we used gears with the teeth cast in green sand, then we cast a blank and cut the teeth, and after this we made the gears with chilled cast teeth. These changes were made to get

away from the excessive wear on the gear teeth. Then we tried shields on them with little better success. From gears we went to sprockets and chains with good shields. This, when the demand for small and lighter tractors, allowed us to use heat treated alloy steel gears running in oil in enclosed cases. The same evolution was gone through with the engine clutch, fan, cooling system and transmission.

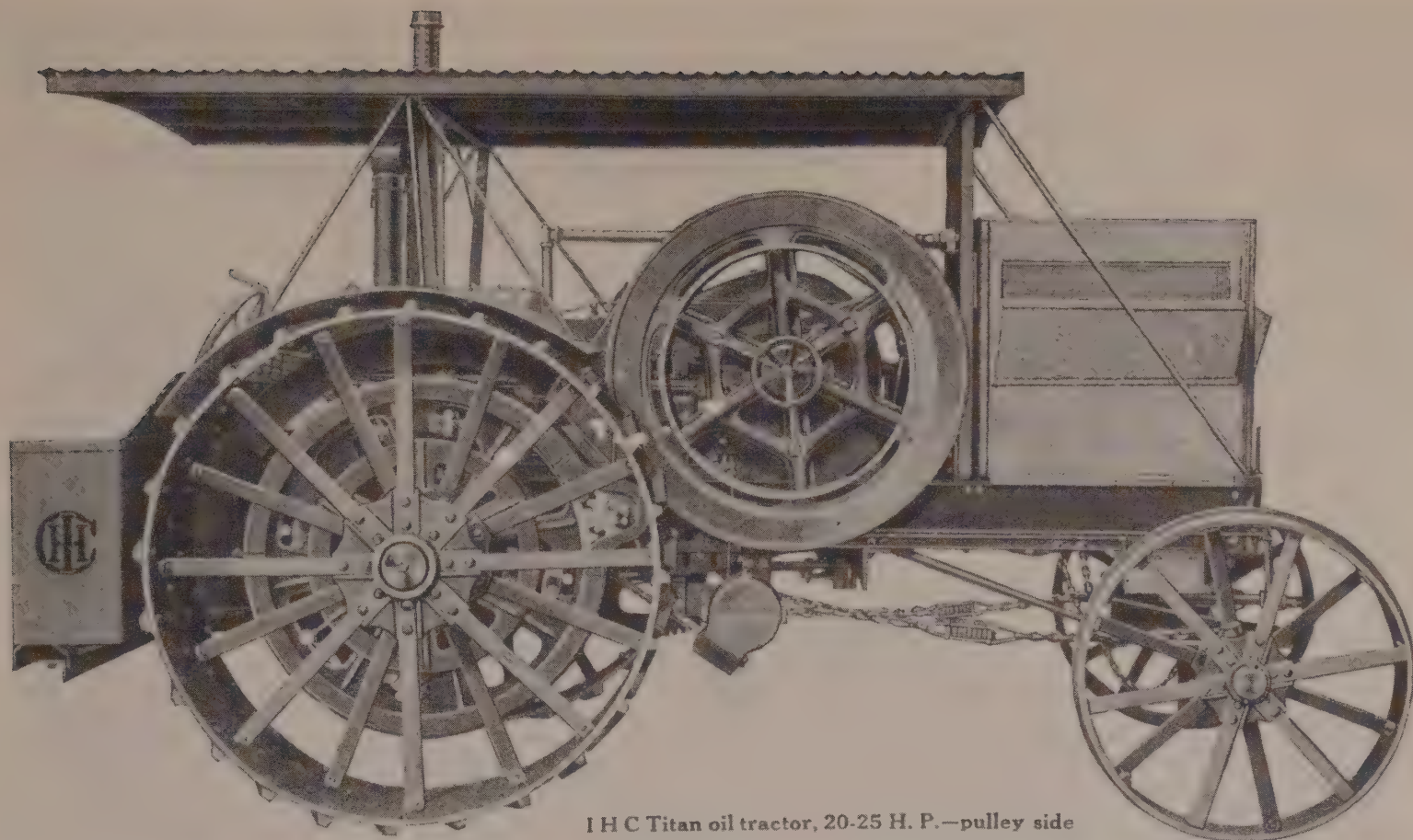
On January 30, 1910 we moved to Chicago and started to build our first tractors at Blue Island and Oakley Avenues. Mr. Morrow, our present Superintendent, could be found during the first ten months in the little shop, running a drill press; spinning bearings; firing the steam plant; making drawings, purchasing tools; rivetting wheels; issuing tools, etc. He actually helped erect the first I.H.C. Tractor Shop, which was a nice big roomy tent with worlds of ventilation, especially in the winter. This tent was destroyed by a wind storm, January 1, 1911, and a few days after this occurred we moved into the first unit of our present Plant.

With Mr. E. A. Johnston as Superintendent and Mr. Morrow as his Assistant, it has always been a mystery to me how, during the first two years any of the Foremen, especially the Assistant Superintendent survived. There was the forming and breaking in of an Organization; buying of machinery; setting it in place; hiring men; keeping up production at all times; getting castings without pattern equipment, and many other heart-breaking trials.

Our castings had to be obtained from McCormick, Deering, Akron and Milwaukee Works, Brady Foundry and anywhere else we could possibly squeeze them in. Many were the problems that had to be solved as to how to get our pistons, exhaust valve gauges, piston rings and cylinders without blow holes and of iron that was not porous and still soft enough to machine. There were thousands of problems of this nature and many changes of design, through all of which we were guided and kept straight by a man who knew the Tractor game and had a clear vision of future Gas Power as applied to the farm, Mr. E. A. Johnston, first Superintendent of Tractor Works.

We made many errors and he told us how to correct them. We committed many acts of foolishness and often received a good calling down and when we were discouraged he encouraged us always.

It is a pleasure at this time to set down in writing my early recollections of the Tractor Industry humble though it was.



I H C Titan oil tractor, 20-25 H. P.—pulley side

L. B. SPERRY
Chief Engineer—Tractors
Gas Power Engineering Department
Recollects That:

Prior to June 1908 the Tractor industry at Milwaukee Works consisted solely of manufacturing motors for friction driven tractor trucks in 10, 12, 15 and 20 HP sizes. The tractors were designed originally at Upper Sandusky, Ohio, and at Akron Works, and consisted of the open crankcase hit and miss governed single cylinder horizontal engine with special crankshaft. The forward and reverse motion was secured by shifting the whole power plant on rollers to engage the direct drive and by a toggle operated idler friction roller for the reverse. Cooling was accomplished with water carried in an open tank and pumped through the engine cylinder jacket returning to the tank by spraying down a wire cloth screen. Ignition was from battery and coil to make and brake type ignition. These tractors were very heavy for the size of the power plant and were in no way protected against dust, hence, were none too well suited for agricultural work. The Tractor units were assembled both at Milwaukee Works and Akron Works, depending upon whether the outfit was to be shipped east or west.

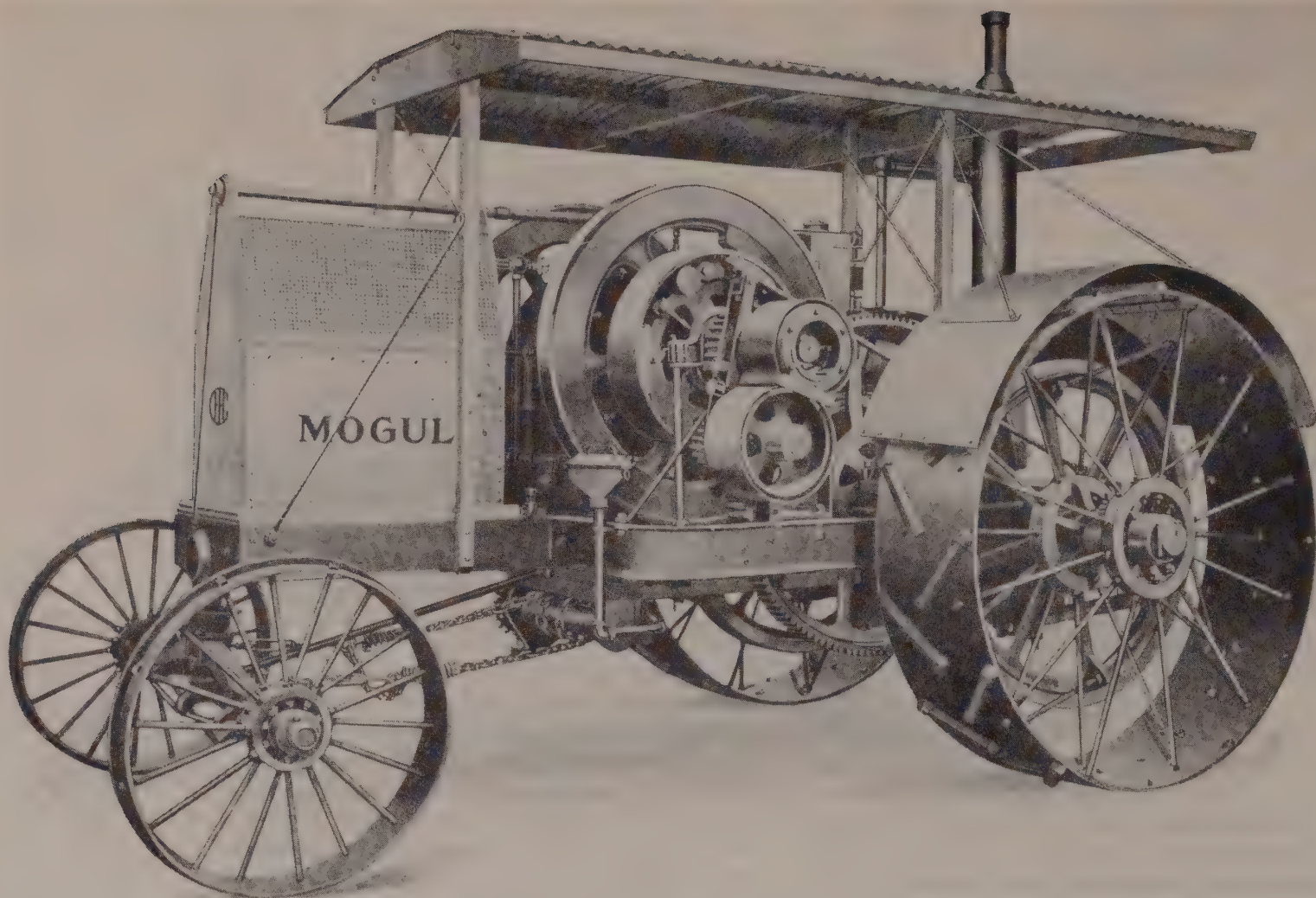
The first tractor truck shipped to Milwaukee Works from Akron was taken apart by Mr. H. A.

Blacken and complete specifications were developed in this way, Mr. Blacken still has charged of the Gas Power Specification work at the Tractor Works.

Some experimenting with Lambert & Company and Brown Company engines on tractor trucks were undertaken during the early Spring of this year and about the first of June 1908 the Company delegated Mr. P. R. Hawthorne to design and build a new type of tractor. The summer was spent in laying out and planning the tractor arrangement. In the Fall of 1908 Mr. Hawthorne began the design of a twin cylinder, twin crank motor for the tractor. Assisting Mr. Hawthorne on the engine design was Mr. Gust Schwaonz and on the truck design J. D. Sperry the writer's brother was employed late in November of that year.

This tractor motor was of startling design for that time, it being designed to operate with a throttling governor and to burn kerosene. Removable cylinder sleeves or liners were used. It was also laid out with a tight crankcase and a transfer port so arranged that the crankcase compression could be used through the mixer to obtain greater cylinder efficiency.

Titan Type D 20 and 25 HP tractors. These tractors used the regular Famous 20 and 25 HP engine with extended crankshaft. Over a period of years the Famous line of engines proved to be a very well built engine as there are many of them in the hands of collectors today.



The Type C Mogul tractor was built in 20 and 25 HP sizes. It appears that the 20 HP size was more popular since more of these tractors exist yet today. Unless you have had the chance to see one of these tractors, it is hard to imagine their size. The 20 HP weighed well over 14,000 pounds, and the 25 HP over 17,000 pounds.

The truck was also of novel construction being gear driven throughout with countershaft gear train on one side of the motor and bull gear train on the other and differential on the rear axle. Automobile type steering was selected and the flat "T" head spoke used in the drive wheels. The tractor was completed in April 1909 and put into test for development.

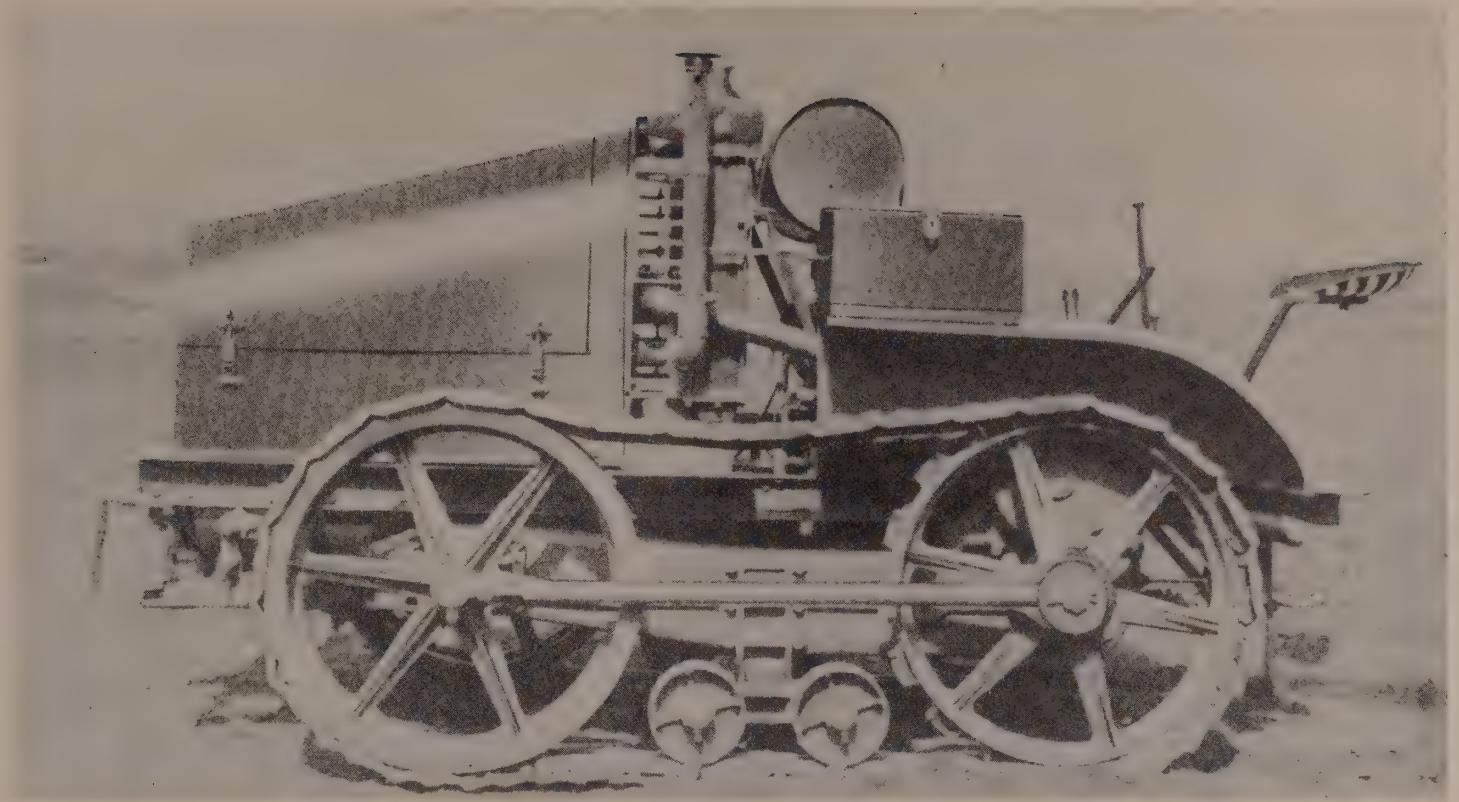
In May 1909 it was decided to develop tractors of similar lines in 20 and 25 HP and to send these to the Winnipeg Plowing contest in the early part of July. On May 22nd the program was outlined and design was started. The writer was moved out of the stationary engine department to design one of these tractors. After a fast and furious 40 days of work the tractors were completed and given a short trial before being loaded on cars and shipped to Winnipeg and were painted on the cars while the train was under way. The showing made in the contest did not result in any gold medals for the Company.

Almost immediately after the demonstration at Winnipeg the writer was assigned to re-design the twin cylinder 45 HP Tractor, converting same into the better understood and better liked type of hit and miss governed motor, and this tractor was completed about November first of that year.

We then undertook the re-design of the 20 and 25 HP Tractors. New samples were completed during the early winter and the three tractors—which later became known as the type "D" line—were sent south for winter testing.

Tractor production on these types began in the winter and spring of 1910 and were sold for a while under the trade name of "Reliance".

During August 1909 there was shipped to Milwaukee Works from Akron a 20 HP gear driven friction reversing type Tractor which had been developed by Mr. E. A. Johnston and Mr. C. I. Longenecker at Akron Works. This tractor was put into production that fall and was known as the type "C" line.



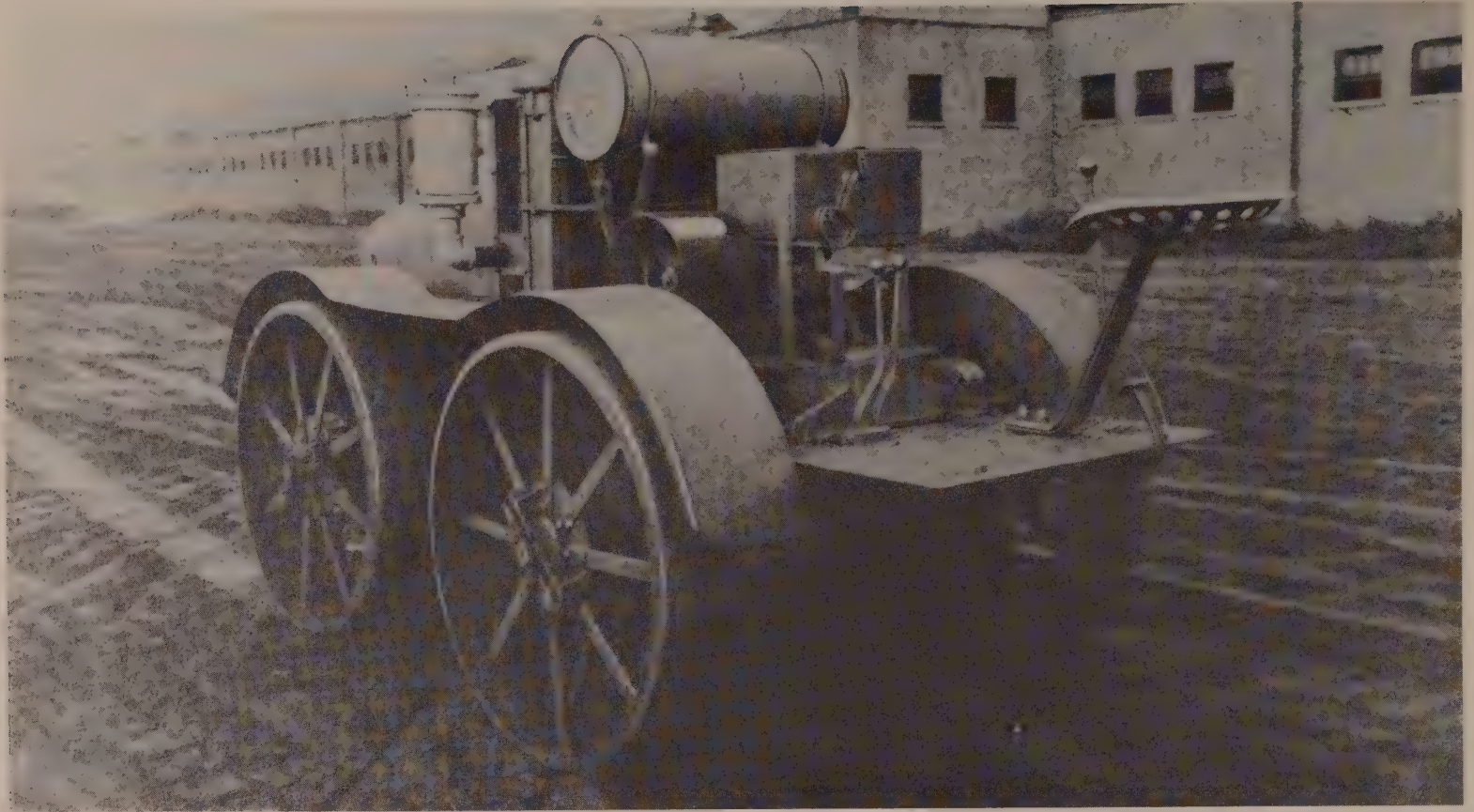
In 1910 a model similar to this but with a 25 HP motor on it was developed and sample built. This tractor was put into production during the Spring of 1911. It was during 1911 that the name "MOGUL" was given to the type "C" line and "TITAN" to the "Reliance" or type "D" line.

In 1911 and 1912 the twin cylinder 18/35 HP tractor was designed and sample built. This was designed by Mr. E. D. Eliassen under Mr. Waterman's direction. This tractor was put into production late in 1912.

In the late fall of 1912 design of the first four (4) cylinder model built by International Harvester Company was started. This motor was of the ell head type and was an especially well conceived design from the standpoint of compactness and protection against dirt. It was fully spring mounted, with chain and sprocket final drive. The tractor was completed and sent to the plowing

field on April 4th, 1913 but it was not until the middle of August that this fact became known to any but the Milwaukee Organization. This tractor was tested very severely for two years before it was decided to build it in quantity. In August 1914 the first one was sold to a Mr. Adams on the Kankakee Territory. Owing to our having repainted this tractor with three different sets of colors and not covering completely, the colors first used, with the last ones, Mr. Adams became convinced that he had been sold a second-hand tractor and a stormy period between Mr. Adams, the Kankakee Branch Manager and the writer occurred before the tractor was allowed to prove its merits. Mr. Adams used this tractor four years and became more enthusiastic each year, also persuading three of his neighbors to buy this same type.

Efforts to develop the 8-16 as a crawler tractor ended in disappointment because of limited knowledge as to how to make track that would last and not wear out quickly.



This four-wheel drive is one of 10 units built in 1918. It was a well enclosed gear drive tractor and was provided with a differential steering unit that was quite successful. One unit was in use near Aurora, Illinois, for so many years that repairs needed became a problem for IHC to supply, yet the owner could not be persuaded to part with it. Expense of manufacture and patents on the differential steering were deciding factors in the conclusion not to manufacture it.

In 1916 this tractor was redesigned from the ell head to a valve in the head type motor and a new improved transmission was put into it. In this shape it was manufactured since April 1917. In the late fall of 1914 the design of the present 10-20 Titan Tractor was started and the first sample was taken to the plowing field near Milwaukee in April 1915. Two (2) samples were built and tested throughout this summer and fall and were sent to Texas for winter testing, the following summer 15 tractors of this type were built and sold, the first one going to the Springfield, Ill., Territory at Carlinville, where it created much excitement, by a 60 hour non-stop plowing stunt with no trouble developing.

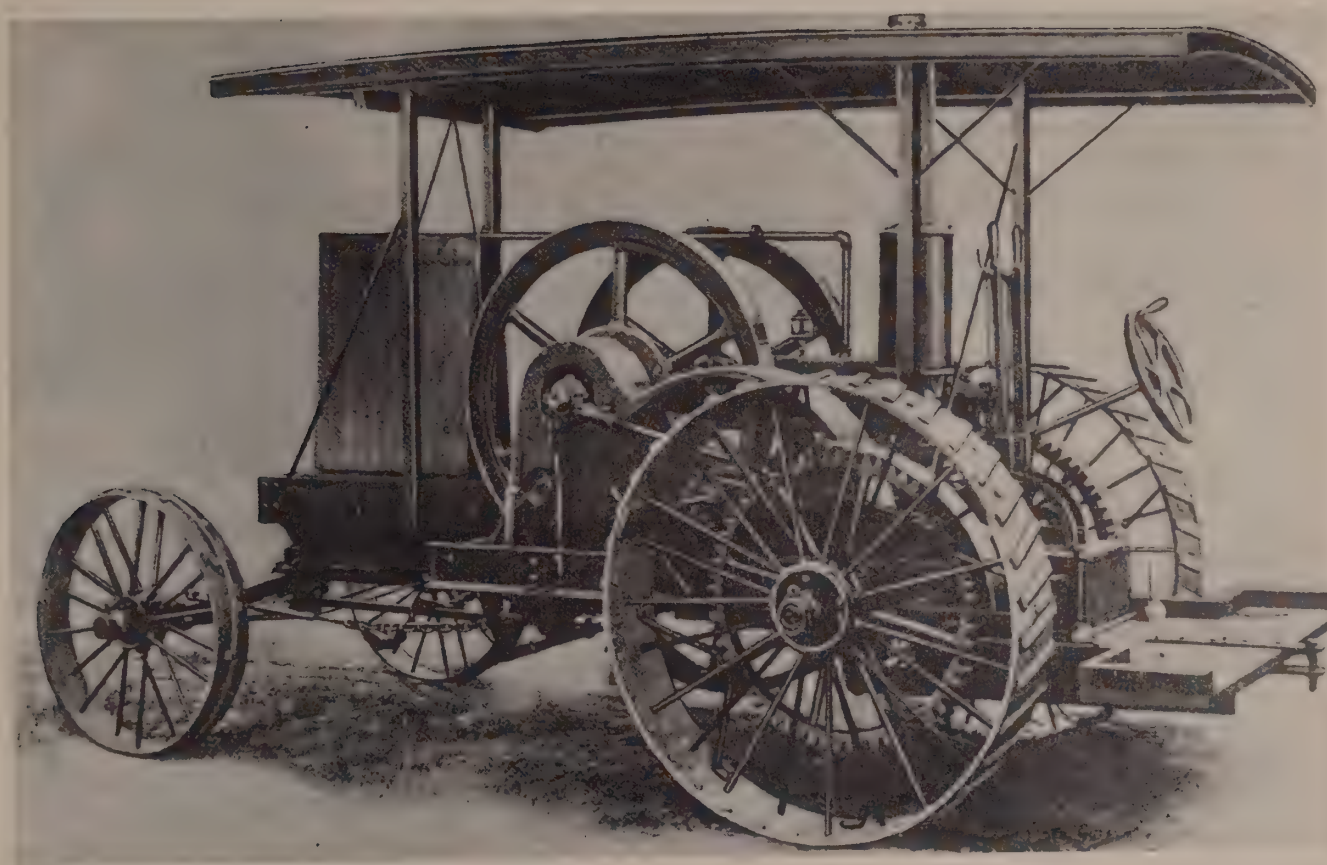
In November 1915 this design was materially improved by separating the cylinders from the crankcase, adding high tension magneto ignition and improving the transmission assembly, and when these changes were completed the Tractor was released for manufacture.

On February 28, 1916, (after borrowing several parts from the Experimental Department) the manufacturing department completed the first Tractor keeping their promise of production to start by March 1st, 1916. The Tractor as made today is practically identical in construction to the first model.

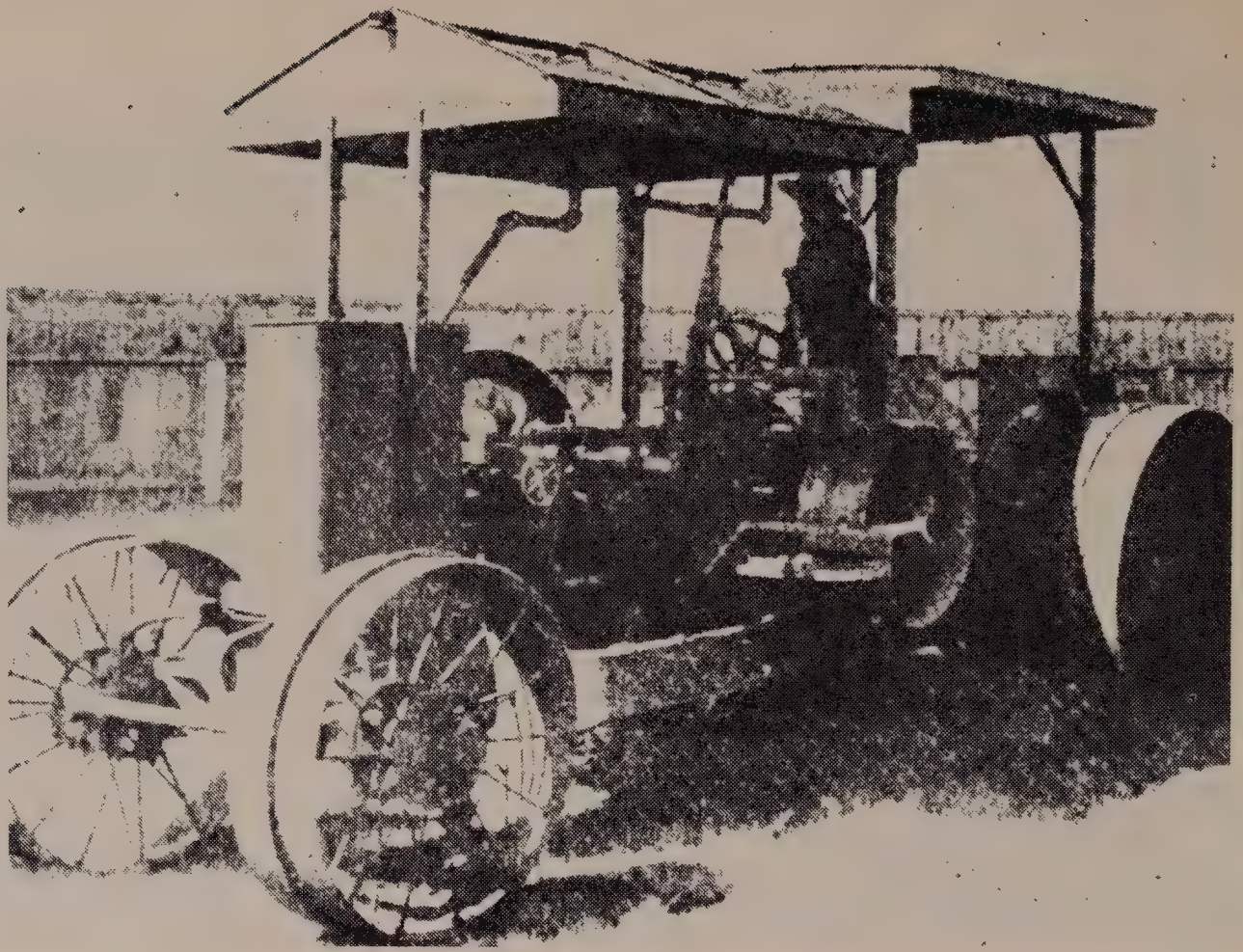
In April 1917 the Experimental Department at Milwaukee Works was moved to Chicago and consolidated with the Experimental Department, at the Tractor Works, into the Gas Power Engineering Department, and although no new models have been adopted for manufacture since that time, the department has designed and tested many types of gear driven Tractors, Crawlers, 4-Wheel Drive Tractors, and Motor Cultivators.



This six-wheel drive was an outgrowth of the four-wheel unit, and 5 of these were made for the California citrus fields. The four-wheel drive unit pictured elsewhere, had not done too well in crossing irrigation dikes and ditches. In this work the six-wheel drive was exceedingly successful, but its differential steering did not turn short enough for the headland requirements. The patent situation applied to these units the same as the four-wheel units.



1905 Friction-Drive experimental tractor built under the direction of E.A. Johnston. The tractor pictured here used a standard 10 HP Famous engine mounted on a chassis supplied by the Ohio Manufacturing Co. (Note the flat radiator instead of the standard cooling tank used on these engines. This engine still has the regular muffler also). Production of these tractors started in 1906 for potential sales to farmers.



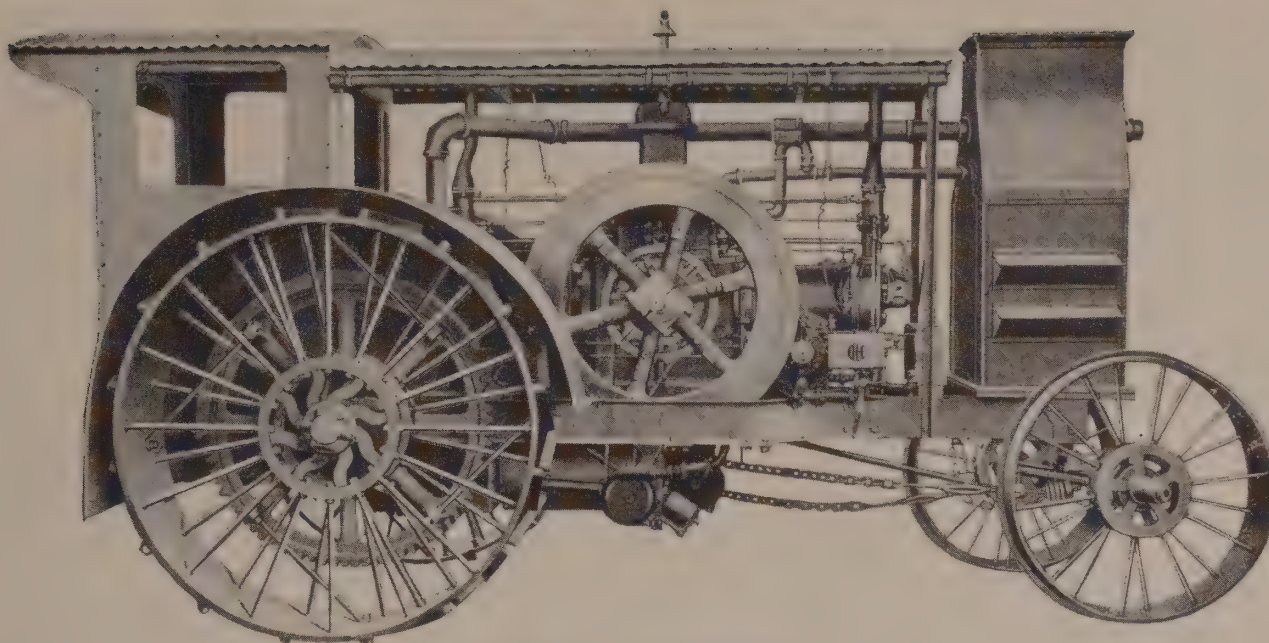
DAVID B. BAKER
Assistant Chief Engineer
Tractors, Gas Power Engineering Dept.
Recollects That:

This photo from a *Canadian Thresherman* magazine is of an experimental tractor demonstrated at the Winnipeg Industrial Exhibition in 1908. This unit was equipped with a three cylinder 40 HP engine. Information on this prototype machine is very difficult to find (This photo and information are from *150 Years of International Harvester*, with permission of the author).

In 1905 the first work on Tractors was begun which I had anything to do with. This was at the Keystone Works under the supervision of Mr. E. A. Johnston. The machine which was started at Keystone was never completed. It was a three (3) wheel type with single wide wheel in front.

In February 1907, the work was transferred to McCormick Works, along with Mr. Johnston and part of his organization. Another Tractor was designed and one machine completed. It was of the four (4) wheel type with two (2) speeds forward and reverse. The drive was through a friction clutch to gearing with final drive of malleable chain. The first machine completed was equipped with a Brennan motor, tank cooled. Later a three (3) cylinder four (4) cycle motor was designed for the Tractor.

In the fall of 1907, we were again transferred, this time to Akron Works and the tractor was taken along. The new motor was mounted on the old truck, some improvements made and the entire machine made ready for the Winnipeg tests. Tractor improvements came very rapidly from this time on. Another machine was designed which was later improved and made the 45 HP two (2) cylinder opposed Mogul. The first machine of this type was of the four (4) wheel type and had two (2) speeds forward and friction reverse. The motor was a four (4) cycle 9" x 12" opposed motor and was mounted on the frame with gear transmission to the rear wheels. Later developments caused the increase of the bore to 9½" and changing to only one speed forward.



IHC Mogul Oil Tractor, 30-60 H. P.

It was under considerable difficulty that the first machine was built; due to the size of many of the parts, it was necessary to have all of the work done outside, causing great inconvenience. After the machine was completed it was tested for some little time around Akron Works and later sent to the Kankakee swamps for further test. Along at this time, experimental work was being carried on on what was later known as the type "C" machine and was a 20 HP "Famous" engine, mounted on a four (4) wheel truck. The power of the engine was transmitted to the rear wheels through a friction clutch and cast spur gears. The machine that was being built for the trade at this time was a "FAMOUS" stationary engine, mounted on the frame so it could be moved, thus engaging two friction wheels, the final drive being through cast spur gears.

In January 1910 the Tractor Experimental Department was transferred to Chicago and located in a small brick building on the premises of the McCormick Works. In this building the first 45 HP Mogul Tractors were built and shipped to the

trade. Shortly after our arrival in Chicago, ground was broken for the new Tractor Works, 2600 W. 31st Blvd., where the present plant is now located.

While at the little plant on Blue Island Ave., work was started on the 25 HP Mogul Tractor, later known as the 15/30 Mogul. It was this Tractor that the metal cab with which the large machines were equipped, was developed. The first machine of this type was built with a single cylinder $9\frac{1}{2}$ " x 12" horizontal motor and was manufactured for some time.

At the same time work was being done on a four (4) cylinder vertical machine with two (2) speeds forward and reverse, all gearing enclosed, final drive through double chains. This machine was never developed. All of the machines mentioned previous to this were designed for gasoline as fuel. Work was being carried on and the development of the kerosene mixer was brought to the point where it could be supplied to a Tractor Motor. The machines that were being built were of the hit and miss type governor, and it was found advisable to

Mogul 30-60 HP tractor. This tractor was mostly an upgraded version of the Mogul 45. The Mogul 30-60 had a total length of 216"; width, 110"; height, 118"; and weight of 21,700 pounds with all tanks empty. Note the improved radiator over the one used on the early Mogul 45 as pictured on page 19.



During 1920 this machine was built and tested. Various attachments built to work on it included the mower shown here. A binder, buck rake, two-furrow plow, two-row corn planter, two-row cultivator, and two-row corn picker were the other implements built and tested for this machine.

use the throttle governor with the Kerosene mixers, and motors had to be changed and the Kerosene mixer applied.

The 45 HP Mogul was strengthened where reports from the field showed it necessary and this meant practically a redesigning. The motor was increased from 9½" to 10" bore and the rating changed to 30/60 HP.

There was designed to meet a trade requirement the two (2) cylinder 10" x 12" vertical motor equipped Tractor which was known as the 30/60 HP Deering. This machine was designed, built and sent to Aurora for test. Five (5) machines were later built and sent to South America. About this time the trade called for a lighter tractor and the 12/25 HP Mogul was designed, tested and built. This machine was the first step toward the present day light weight Tractor. It was equipped with a two (2) cylinder opposed motor, two speed transmission and double chain final drive.

There was designed the four (4) wheel drive machine and extensive experiments were carried on to determine the advantage of this type of machine.

The call came for a lighter and cheaper Tractor, so two (2) different types of machines were designed; a four (4) cylinder three (3) speed machine and a single cylinder one (1) speed machine. The single cylinder machine was designed, tested and built. It was known as the 8/16 HP Mogul Single Cylinder which was a low speed engine, the power for which was transmitted to the rear wheels through a planetary transmission and a single chain drive. This machine was later re-designed, the cylinder bore increased and the tractor equipped with two (2) speed sliding gear transmission and called the 10-20 HP Mogul.



The original four (4) cylinder 8/16 Tractor was equipped with the motor used in the International Model "G" Motor Truck. The experimental machine was built, tested and returned to the factory. The machine was re-designed and equipped with a 4" x 5" — four (4) cylinder motor and after being thoroughly tested it was turned over to the shop and is at present known as the 8/16 HP International.

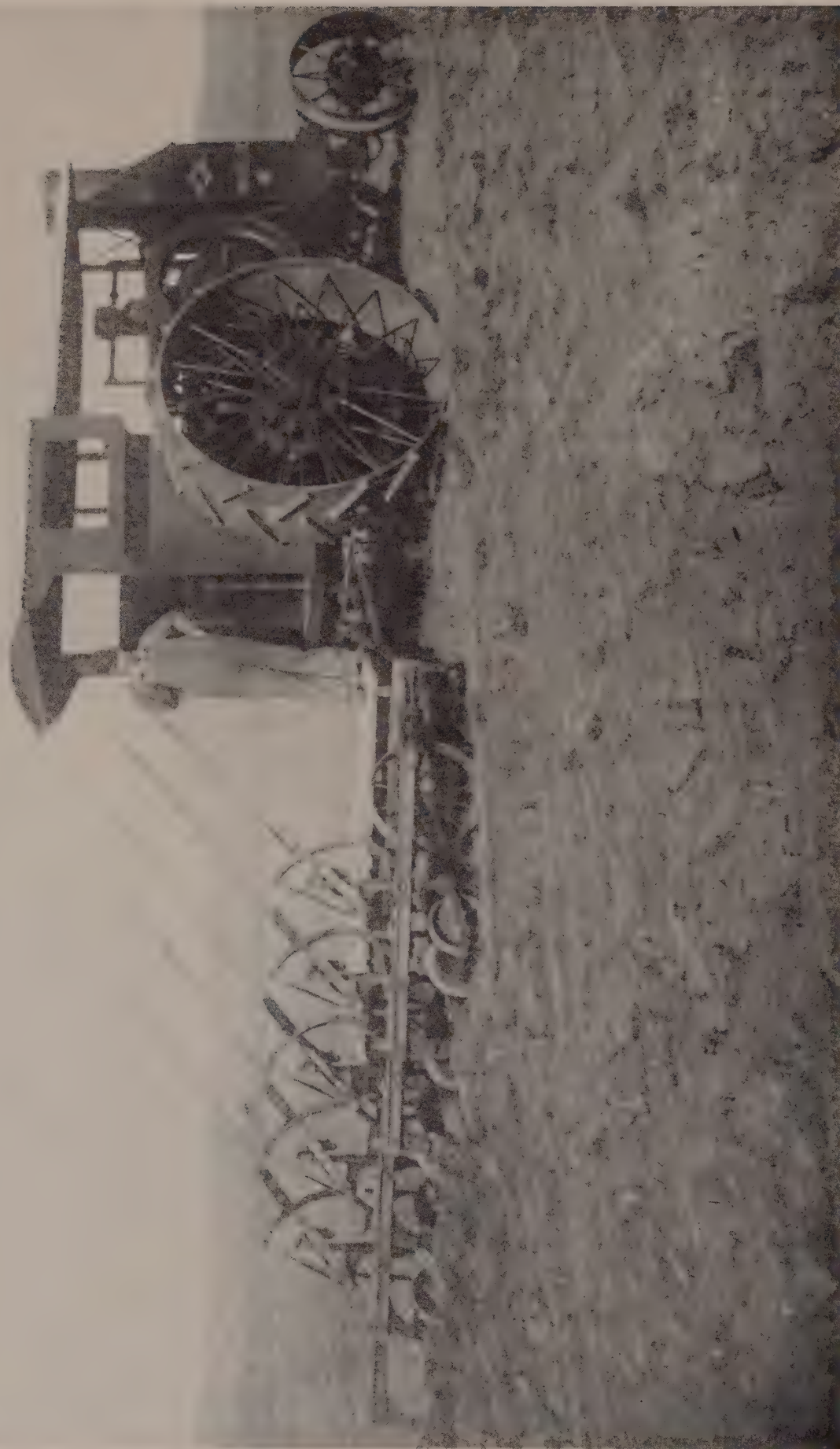
There were several other tractors designed, tested, and limited number built. One was known as the 10/20 HP Mogul. This was a single cylinder machine of the same general design as the 15/30 HP Mogul. The other machine was known as the 20/40 HP Mogul a four (4) cylinder machine with two (2) speeds forward and reverse gearing, entirely enclosed and running in a dust and oil tight case. Ten (10) of these 20/40 HP machines were built and sold after being thoroughly tested.

A 5/10 HP Mogul Tractor was designed, this machine being a duplicate of the single cylinder 8/16 HP Mogul. This machine was tested but none were built for the trade.

In 1915 or 1916, work was begun on applying power to a corn cultivator. The first attempt not being very successful, but in 1917-1918, a motor cultivator was developed which was successful. A number of these machines were built and sold. In 1919, the scope of the motor cultivator was enlarged and a much larger and heavier machine was developed to handle a number of other farm machines, such as planters, mowers, binders, sweep-rake, corn picker, etc. These machines are all designed as units and are quickly attachable to the motor cultivator power plant. The experiments on this equipment along with the power plant are going on at the present time, April 1920.

If it is possible to develop this entire outfit satisfactorily, it will no doubt be known as the "FARM-ALL" Tractor, the name by which it is now known.

During experiments to develop the Farmall tractor this tracklaying unit was built and tested. This unit was built sometime in 1919.



Mogul Jr. pulling five 14" bottom plows. After being built for only a short period of time a few modifications were made and this tractor was upgraded as the Mogul 15-30. These tractors also used a single cylinder engine.

EARL C. LUTZ

General Foreman Engine Assembly Floor and Yard Test Departments Recollects That:

While serving my apprenticeship at Keystone Works, back in 1905 and 1906, a little work was done but not much progress was made on an experimental Tractor at the Rock Falls Plant, then known as the Keystone Manufacturing Co.

Early in 1907 the Experimental Department was moved to Chicago and of course, the unfinished Tractor with it. Considerable progress was made while at Chicago at the McCormick Works, such as changing the design of the machine work and minor assembling, but the parts were not finally assembled or the Tractor completed until after the Experimental Department had been transferred again, this time to Akron, Ohio, the move taking place sometime in the Fall of the same year.

Spring had passed and we were rapidly approaching the summer of 1908 before the Tractor was finally completed and given its first field test. No doubt this test proved fairly satisfactory for the Tractor was sent to Winnipeg Canada shortly after and entered in the contest there. After the demonstration considerably more interest and greater activity was taken in the Tractor end of the Experimental Department and a complete change in design was made. Instead of a three-cylinder engine capable of developing about 40 BHP a two-cylinder opposed type of about 65 BHP was designed with many radical changes in the truck and cooling system. This type of Tractor was no doubt the Father of the Mogul line in later years. We must be frank and admit that we had our own troubles going through the Experimental Stage. Many changes were necessary to the ignition and cooling system which were very important ones in a heavy duty engine of this design.

The new Tractor was completed in the late Spring of 1909 and given a try out with good success. It was found, however, that the speed of the machine was too high and of course, this cut down the draw bar pull considerably. If I remember correctly this Tractor was only capable of pulling three (3) 16" plows not over 6" deep.

About this time Mr. Johnston and Mr. Longenecker also built a smaller type of Tractor but I am not enough familiar with the details to give the information covering this Tractor, or those built under the supervision of Mr. Morrow at Akron Works.

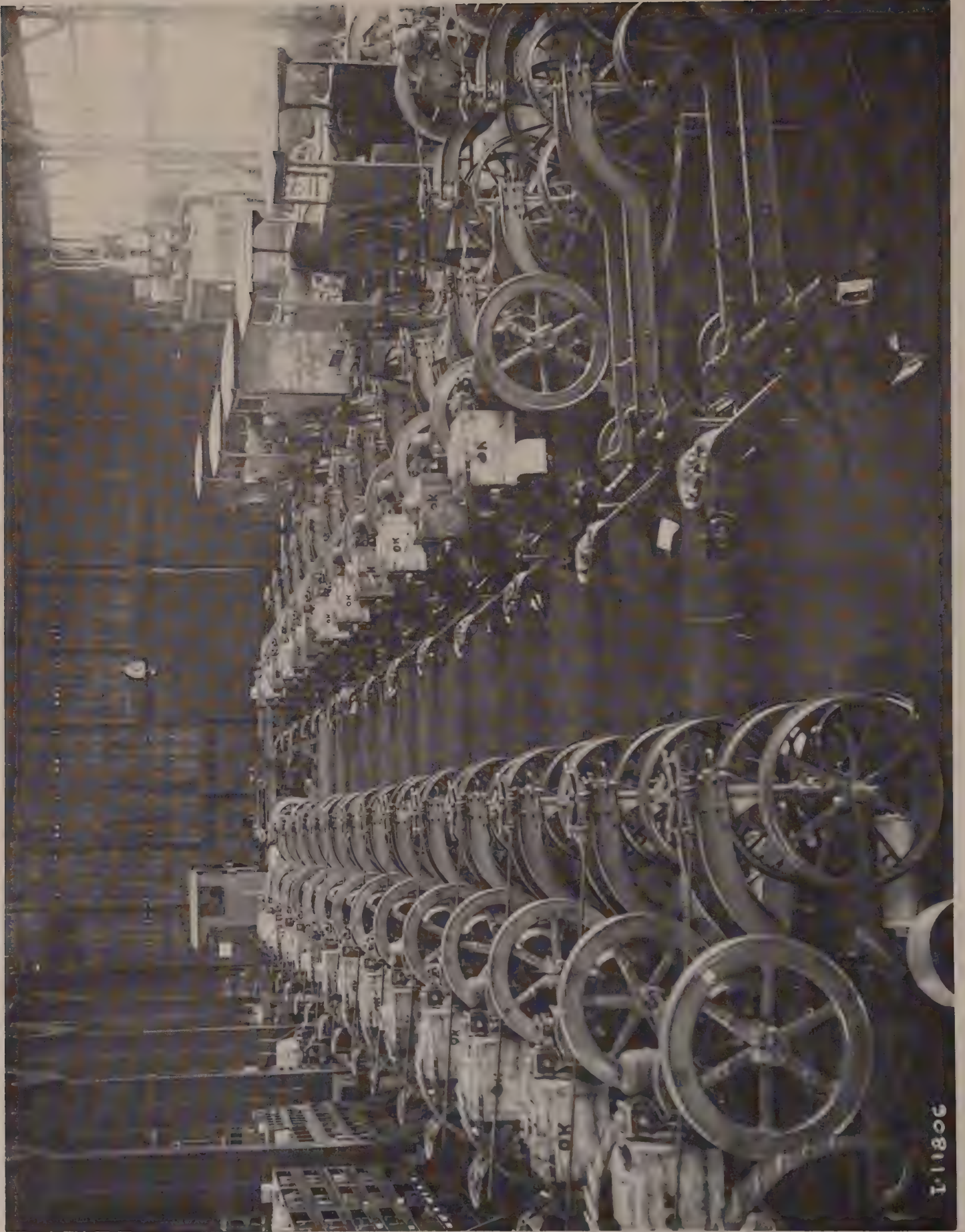
Experimental Works continued steadily on this two-cylinder type of Tractor and on the 31st day of January 1910 the Tractor Experimental Division was transferred to Chicago to take up permanently the work of perfecting a tractor for the trade.

We began work after our arrival in Chicago in a small building on Blue Island Avenue, a part of the McCormick Works. The place was cleaned out, new machinery installed, jigs made and machine work started.

We began work in our new home with a force of about ten (10) men, including all occupations. By this time ground had already been broken for the new Tractor Works on the Blvd. After about the third tractor was complete, I was assigned to road work and of course, cannot relate much of the progress made during my five months absence. When, however, I returned sometime in the month of November, I was surprised at the number of men employed and the number of Tractors turned out.

January 1911 found us located in the new Plant and schedules made for three (3) 45 HP Tractors per day and one (1) or more of the 25 HP, both of which were changed later into 60 and 30 HP respectively. The 25 HP was a single cylinder Tractor developed during my absence on the road.

Before the summer of 1911 had passed we were turning out five and six of the 45 HP tractors per day and our progress from that time on is well known by all.



Erecting floor at tractor works. It shows the following Mogul tractors being assembled: thirty 8-16, five 12-25, and one 30-60.

T-11806

HOMER C. WELLS
Foreman Engine Erecting Dept.
Recollects That:

He commenced his Tractor engine work in November 1907, at Akron Works under Mr. H. B. Morrow, with Mr. E. A. Johnston at the head of the Experimental Department.

That, the first Tractor built was a 15 HP Type "A" Friction Drive and that we also built a 20 HP and 12 HP of the same type. In 1908 we built the Type "B" engine known as the Gear Drive and built them until 1910, and in that the year the Tractor Works was moved to Chicago and operations started in a small building on Blue Island Avenue with Mr. E. A. Johnston as Superintendent and Mr. H. B. Morrow as Assistant Superintendent.

The first Tractor built after moving to Chicago

was Type "C" 45 HP. Early in January 1911 we moved into the new Works on the boulevard and in 1912 added the 15-30 Tractor to our list. In 1913 we commenced building the 45 HP which was later changed to a 30 HP.

In 1914 the 12/25 HP Tractor was started as was also the Single Cylinder 8/16. In 1916 this 8/16 was changed to a 10/20. In 1918 we commenced building the 15-30 International and in the same year commenced building the 8-16 four-cylinder International.

We have seen the Tractor grow in production from one per week to sixty-five and seventy per day in ten years, with the demand before us undreamed of when the industry was started.

Inside pattern shop. Here workmen are shown working on patterns for the Mogul sidshaft engines.



C. A. OHLIN

**Foreman Small Assemblies Department
Recollects That:**

In the Fall of 1910 I began my service in connection with the Tractor, having been hired by Mr. E. A. Johnston, Superintendent, my check number being #1. I was the second man hired after the work was transferred from Akron to Chicago, Thor Waharmon having been the first.

Our work in the little shop on Blue Island Avenue was conducted with many hardships. The Tractor assembling was done outside in a canvas tent. We had no tools to begin with. I remember very well that I made up a vise for my own use in the shop out of parts I had found in the scrap pile. We surely started under great difficulty.

Mr. Hostetter who had charge of the Experimental Work, with two or three men was transferred from Akron Works.

Mr. Lutz worked in the shop for awhile and was finally sent on the road to follow up the first 35 HP Tractors that we built.

Practically all parts of the Tractor were machined to layouts for the lack of jigs and tools. Our first gauges were made with the use of calipers and scales for the lack of micrometers and some of these gauges are still in use for repair parts on the older engines.

Our Foreman Mr. Morrow, held a great many positions, Foreman, Shipping Clerk, Trucker, and anything else that he could not find anyone else to do. Our stay in the little shop on Blue Island Avenue was short and we moved into the first unit of our new building about one year later. The building was not complete at the time and it seems to me that the Tractor Works never will be complete as we are continually building additions to it.

Our machinery, tools and gauges are now as good as money will make and our trucking and transportation has been taken away from Mr. Morrow and is being done with electric trucks and the heavy work with cranes.

I have seen in the ten years just closing the Tractor Works take up and bring into production ten (10) different tractors and 46 sizes or types of stationary engines besides enumerable attachments for all of them.

R. W. HENDERSON
Manager Road Engineers
Recollects That:

In February 1909 I was employed by the B. F. Goodrich Company manufacturing pneumatic tires. For six years previous to this I had been working for the Vulcan Engineering Company of Albany, New York and the Russell Engine Company of Massillon, Ohio, in the tractor business.

As both of these companies manufactured steam tractors and the panic of 1907 had forced the Vulcan Engineering Company out of business and greatly reduced the output of the Russell Company, I saw no future in the steam tractor game and thought it a great deal better to get into the rubber business. The inside work in the manufacture of pneumatic tires was too confining, and realizing that the internal combustion engine was the coming power and would supplant steam tractors entirely, I thought the proper thing for me to do would be to get into the employ of one company manufacturing internal combustion engines, so on March 3rd, I made application to the International Harvester Company at Akron for a position as tester in their tractor department. I was interviewed by Mr. H. B. Morrow with the result that I was employed and instructed to start to work the following day. Mr. Morrow informed me at this time that old employees did not necessarily take precedence over new employees where the new employees were of more vital importance to the organization and the Company. He also agreed to pay me the wonderful salary of \$1.75 per day of ten hours, in other words—17½¢ an hour.

At this time the Company was manufacturing three (3) tractors a week, or rather assembling three (3) tractors. The engines were made at Milwaukee, thoroughly tested and shipped to the Akron Works where we built the frame, mounted same, gave them what testing was necessary and shipped them from there to points where they were used by the farmers. The Akron Works at this time was a conglomeration of ramshackle buildings that had been recently purchased from the Buckeye Implement people. The test yard was about 1500 ft. long and 500 ft. wide, filled up with foundry dirt and about the dustiest place a man would want to work in.

I used to take a tractor into this yard in the morning, hitch it onto an old engine casting, give it a hard drag for nine hours and then turn it into the Paint Shop. The tractor itself was a crude affair; the first of them had tops covering the entire tractor made of slats with painted canvas. The exhaust pipe on these tractors came within about 4" of this top and was wide open. The motor was a single cylinder, four cycle, open crankcase type, and with the exhaust gas blowing down in your face after it would strike the roof and the gas coming from the crankcase together with the sand and grit rising from the ground, made it practically impossible for a person to work in the test yard.

About a week after I started work with the Company they changed from painted canvas to corrugated tin roofs on the tractors. The exhaust pipe was then run thru the roof and while it did not eliminate the gas from the open crankcase or the dust and sand from the yard, it made it a great deal more pleasant testing them when the noise and gas was carried above the canopy.

A month after I started to work for this Company a man by the name of J. W. Bradley applied for a position as tester and was hired by Mr. Morrow. Mr. Bradley was put in the test yard with me to test tractors. He wore a standup collar and a goatee—mighty nice appearing and well educated fellow.

I found that after he had been working for the Company about two or three weeks the Russell Engine Company had employed him to design a tractor for them, and that he was simply with the Harvester Company to get what ideas he could. Of course, this terminated Mr. Bradley's work with the Company. Nevertheless, I wish to give him credit for teaching me a great deal about internal combustion engines, of which I was absolutely ignorant when first employed by the Harvester people.

The summer of 1909 was uneventful with the exception that the tractor industry in Akron increased from three tractors a week to four tractors a day until about the 1st of September when we were shut down completely as far as manufacturing tractors at Akron Works was concerned.

In November 1909 we installed a tractor in the Heat Treating Department in Akron to run a fan. Mr. Morrow installed me in this department as day, night and Sunday engineer. While I was only making \$1.75 a day I was able to draw as high as \$50.00 for two weeks work showing that I was putting in time very nearly continuously. I remember one time in particular, after working twenty two hour stretches for three days I sat down on the platform of the engine about 8 o'clock and dropped off asleep. Whether thru vindictiveness or to show me he was boss on the job, Mr. Morrow came around and bawled me out. Nevertheless, taking it as a whole, I wish to express the fact that I was treated royally by the heads of all departments in the Akron Works with whom I came in contact.

In the late fall of 1909 a two cylinder motor tractor with 45 HP was designed at the Akron Works by Mr. E. A. Johnston. This tractor was tested out near Akron and brought back to the Works. Compared with the present day tractor it was about as crude an affair as the ordinary single cylinder that we had been building during the summer.

At this time the Company decided to build a tractor plant in Chicago and installed Mr. E. A. Johnston as superintendant and Mr. Morrow as his assistant. Mr. Morrow asked me if I cared to go to Chicago with the Company and I informed him that I would if they paid sufficient salary. He offered me \$3.00 per day for ten hours labor, which I accepted. Nearly all of the tractor men were then transferred to Chicago, and Mr. Morrow, Mr. Wells, and myself were left to close up shop in Akron.

Among the last things shipped from the Akron Works to Chicago was the two-cylinder opposed motor tractor that had been designed there in the fall. In loading this tractor which had a friction reverse and no brake I accidentally (?) got it going at a little too great a speed on the car. Mr. Morrow had undertaken to stand in front of the tractor and tell me which way to turn it as it was just a trifle wider than the car. The momentum of the tractor together with the open friction reverse being covered with snow and not being able to take hold, let it go forward enough to catch Mr. Morrow between the brake shaft of the car and the front end of the tractor, tearing off the brake shaft and throwing Mr. Morrow to the tracks below. The front trucks of the tractor followed him but luckily just as the tractor was about to over-balance and crash down upon him, the friction reverse which I had been holding against with all my power took hold and the tractor was stopped half suspended from the end of the car. While this was purely accidental, Mr. Morrow still claims that he has more respect for a man who will attack him with a club than with a tractor.

Without anything to do at the Akron Works during the winter, things became very monotonous, but I was eventually called to Chicago arriving there on the 4th day of March 1910, just one year after starting to work for the company in Akron. I found the boys manufacturing tractors in a little shed near the McCormick Works on Blue Island Avenue. Facilities in this shop were conspicuous by their absence, and never having been in a large city to work for any length of time where it was necessary to live six or eight miles from the factory to get the right kind of accommodation, the writer is willing to admit that he was thoroughly disgusted with his \$3.00 job before the day was over. But, in the evening I was taken in tow by Mr. Baker and Mr. Morrow, conducted to a theatre, shown a good time and by the morning of the 5th I had reached the conclusion Chicago was a pretty good place.



30-60 Mogul tractors
undergoing testing at the
tractor works in Chicago.
All the mud must have
made for a real mess!

At this time I got a room at 2336 S. Lawndale Ave., and my board at 2321 S. Lawndale Avenue for \$5.00 per week, and I thought I was paying a tremendous price.

When I finally got located and went to the factory to start work I met Mr. E. A. Johnston for the first time. From that first meeting I always fancied that I had a friend in the organization. Mr. Johnston called me by my first name and took the trouble to take me thru the entire shop and told me what wonderful things they were planning. Then to show me that all is not gold that glitters, they brought a 24 ft. stable tent and installed me out in the backyard building frames. The only chance I had to get even with them for this was to watch until someone picked up the telephone in the office, then start my air chisels going. This would give me the satisfaction of having them chase Mr. Forster out to have me stop the air chisels until they got thru telephoning.

Work went along fairly well until along about the first of September when Mr. Johnston must have seen the ear-marks of a road man on me, and on the 4th day of September he called me in the office and informed me that I should go to LaMoille, Ill., and get a tractor to demonstrate at the Princeton Fair. This is where my work really started for the International Harvester Company, also my trials.

I left Chicago on the night of September 4th and arrived in Mendota where I would have to stay overnight. Upon getting a room at the hotel and getting ready to retire, I noticed that the wallpaper was of a peculiar design. Upon close investigation I found that this design was caused by thousands of bedbugs. Never having come in contact with a bedbug before, I undertook to massacre this bunch by pressing them against the wall with my thumb. This was working out fairly well until for some reason I had to blow my nose, and incidentally smelled my thumb. After this I came to the conclusion that if the bedbugs would occupy the wall I was perfectly willing to leave them there and take the bed myself.

The Tractor that I eventually got at LaMoille and took to Princeton is familiar in the minds of several of some of the oldest employes in this organization. It was a two cylinder opposed 9 x 12 motor running about 330 RPM, hit and miss type of governor, battery low tension ignition used for

starting and a Motsinger low tension auto sparker for running. This auto sparker was run by a friction on the flywheel, and while it undoubtedly would have proved a good ignition device if it had been belted or driven, it was practically worthless where we had it placed, as the friction would become soft on one side and it would be no time at all until the device would be completely hammered to pieces.

Also the oil from the bearings would run out on the flywheel and completely soak the auto sparker. We used a lubricating system on this tractor composed of five gallon iron pot as a reservoir, and a plunger pump that delivered this oil to the top of the crankcase from whence it splashed thru to the moving parts of the motor and returned again to the reservoir. The ignition was low tension make and break. The motor was excellent when it was possible for an expert to start it. The manner of starting these large motors was to take out your igniters, clean and dry them thoroughly, prime both cylinders with gasoline, turn on your switch, then crawl up on the frame and with one hand holding on the water pipe that ran to the radiator and with your right foot on the channel, you would put your left foot in the spokes of the flywheel and grasp the rim of the flywheel with your left hand, and thus if you were able to exert several horsepower you were able to roll this massive flywheel over. If the motor failed to start you crawled down opened the relief cocks, shut off the mixers and turned the flywheel long enough to crank out the over supply of fuel. Our greatest trouble with these tractors was in the starting and since then my experience has shown me that it was simply because the gasoline was too good and vaporized too quickly.

On September 15th, the Company advanced me the grand sum of \$25.00 and sent me to Sioux City, Iowa to demonstrate a tractor at the Inter-State Fair. Mr. Kilbourne then, as now, was Branch Manager at this point and Mr. Flynn was his assistant. I arrived in Sioux City on the morning of the 14th, and we were all that day and night changing the tractor over, re-piping same and taking the auto sparker from the way it was originally fastened, and attaching it to the top of the crankcase where we thought it would accumulate a little less oil.

Assembly line of 8-16 tractor engines.



After finishing at Sioux City on October 3rd, I was sent to demonstrate a tractor at the Springfield State Fair and to put on the new parts the same as had been taken care of on the tractor at Sioux City. This work was finished on October 9th and on October 12th, I was sent to Geneva Ill., to work out and test a single cylinder tractor that had been designed during the summer. This tractor was called a 25 HP Mogul, Jr., single cylinder, make and break low tension ignition, hit and miss type of governor. It was exceptionally heavy for the power it would develop but worked out as good as any tractor that had yet been put on the market. This tractor besides having the regular canopy that was put on the tractors at that time, had a wood cab.

About October 27th, Mr. B. F. Jarvis was sent to Geneva to assist me with this work, and we stayed around Aurora and Geneva testing this machine until December 3rd when it froze up and the machine was re-shipped to Chicago.

During this time gasoline was selling for 12 and 13¢ a gallon, and I was getting good board and room for \$1.00 per day. This machine like all tractors was exceptionally hard to start on cold, frosty mornings, and it was necessary to soak rags with gasoline and wrap them around the intake pipe and heat this pipe and mixer thoroughly before we could get the motor started. We had no very good facilities for handling our fuel, so the writer procured two, three gallon candy buckets, one for water and one for gasoline. The gasoline pail had a large red "G" painted on the side but this became covered with grease so that it was practically impossible to tell them apart, and one morning Mr. Jarvis filled the water bucket with gasoline. We had just thoroughly warmed the tractor up and got it started, and the rags that were on the mixer were knocked off and fell under the tractor. Being afraid that these burning rags might set the grease afire on the tractor, of which there was quite an extra amount, I picked up what I had presumed was the water bucket and dashed the three gallon contents under the tractor to put out these burning rags. Mr. Jarvis was in the cab and had presence of mind enough to throw in the clutch before jumping out. The sight that followed, while expensive in a way, was really beautiful. The tractor walked off across the field dropping a burning board from the cab about every hundred feet. After the cab and wood parts had completely

burned off and we had again lassoed "Barney" as we called her, we spent the rest of the day putting on a canopy and thereafter had to do without a cab.

On December 28th, I was sent to Mark Center, Ohio to investigate a tractor that had been running there nearly the entire summer. This tractor was setting opposite a barn about half covered with snow, and I got the surprise of my life when, after priming this machine and turning on the batteries, I got up and tramped on the flywheel and it started the first turn over.

On February 15th, 1911, I went to Kirkland, Ill., to replace cylinders on a tractor owned by Mr. McQueen. On this particular machine the piston pins had come loose and scored the cylinders badly. The cause of this was the connecting rod bolt did not draw the connecting rod on the piston pin giving it a little chance for play and it finally cut its way thru the bolt, slid endways and damaged the cylinders.

On the 17th day of March, Mr. Johnston called me in his office and told me they had about two weeks work in Montana at Great Falls in the Helena territory. I left Chicago for Great Falls on March 18th, and did not return to Chicago until October 15th. Therefore, when Mr. Johnston sent me out on a two week trip I always took six month's supply of clothing along.

During this period I traveled over the entire northwestern part of the United States and Canada, east as far as Winnipeg. I had the misfortune to break three fingers by getting them caught in a belt that drove the water pump on a tractor on May 1st. I was ordered to Winnipeg from Regina on June 29th, and brought a 45 HP Tractor thru the Worlds Motor Power Contest at Winnipeg during July, coming out second best in this contest.

During the month of August I spent nineteen nights on a sleeper in Canada. This was not because of runs between jobs being so long, but because the train service was very slow and poor. At this time Canadian land was booming and to sell a tractor it was only a matter of delivering it to a man's farm. The repair proposition was our worst trouble at this time and once it became necessary for us to ship a complete 45 HP motor to Mortlake, Sask., by express. Nevertheless, I always figured that our tractors stood up a bit better in 1911 on the Canadian plow fields than any other make of tractor on the market.

On October 16th, 1911 I was transferred from the Tractor Works to the Foreign Sales Department, given a first class ticket and \$100.00 and started for Germany. I sailed from Hoboken on October 19th, on the North German Lloyd steamer George Washington, together with H. B. Gray who was at that time experting for the Company also. We arrived in Bremen, Germany on the afternoon of October 28th, and reported immediately to our Manager Mr. Yeslin at Hamburg. Mr. Yeslin gave us the once over, informed us that he did not think Mogul tractors were worth a damn, kept Mr. Gray in Hamburg and chased me on to Berlin to see Mr. Hootmacher who was our Berlin Manager.

As I was unable to speak the language Mr. Yeslin telephoned to Mr. Hootmacher and told him to have a man at the depot to meet me when I arrived in Berlin. He described me to Mr. Hootmacher and instructed me to carry a newspaper in my hand. I arrived in Berlin about 5:30 when it was just beginning to get dark and after running all over the station with a newspaper in my hand I came to the conclusion that I had best try to find the International Harvester Company offices myself. Upon going outside of the depot I located a cab and by means of signs and motions and quite a good deal of coaxing I made the driver understand that I wished to go to the offices of the International Harvester Company.

I arrived there about 7 o'clock, found everybody on the job and busy, in fact so much so that they had completely forgotten I was coming to Berlin. This was on the night of October 30th, and I thought they would at least give me a day to get my bearings, but no such luck. Mr. Hootmacher immediately sent me to a place called Samtens which is a town on an island in the East Sea.

It was necessary that I stay all night in Strausund as I arrived there about 11:30 and the ferries had stopped running. Here I got my first surprise in Germany. My shoes had become muddy in walking across the street from the depot to the hotel, and I asked the man who was with me where I would find a shoe shining parlor. He informed me there were no such things in Germany but advised me to set my shoes outside my hotel door and they would be clean in the morning. This I found to be a fact and anyone traveling in Germany during that period would do well to do this, because it doesn't matter whether you have your shoes polished or not you have certain obligations regarding tipping that must be lived up to if you expect to return to the same hotel a second time.

On October 31st I crossed down the East Sea and went to Samtens where there were more surprises awaiting me. I found that the farmer who owned this particular tractor had a six bottom Moline Flying Dutchman plow with which he insisted he must plow his land 22" deep. This was an unheard of thing to do to a person just coming from the western hemisphere where soil is never broken over 4" and the average plowing is 6". I did manage to get this plow to dig about 11" deep which is about the maximum depth that any plow made in America for ordinary purposes will plow. The man who owned this farm was about the most important, over-bearing dutchman that it ever was my luck to meet. In experimenting and trying to get this plow down to its maximum depth I took a shear off and requested that he have it pointed a certain way for me so that it would have more suction. He had his blacksmith sharpen it to suit himself and sent it out to me with word that such was the only way he would have plow shears sharpened, that he knew it would do the work, and that they made plows in Germany before America was discovered. The only reason I was able to get along with this man as well as I did was because we could not understand each other, and in that case of course, there was no chance of coming to blows.

I traveled over Germany until November 30th. During that time the Germans undertook to put me between feather beds every night. It was too warm to sleep with feathers over you and too cold to shake the feathers off the side and just use the two sheets that form the tick. I used to go to bed cursing the dutch and get up the same way. Nevertheless I met some very good friends while in Germany, and appreciated the fact that they had the finest railway, hotel and street car service of any country that it had been my pleasure to travel in.

On November 30th I left Hamburg and went to Paris. While in Berlin I had a high powered rifle made to order which I intended to take with me to the Argentine. It was not finished when I left Berlin and I left instructions with our Mr. Badie to express it to me at Buenos Aires when it was finished. As I had a thousand rounds of ammunition purchased for this rifle, I undertook to take them from Germany into France and came very near spending the night in prison for my ignorance in

not declaring them when I crossed the border. I spent three days in Paris and on December 3rd sailed from LaPallice, France to Buenos Aires. I arrived in Montevideo, Uruguay on December 24th. I might mention that I sailed from LaPallice on the R. M. S. Oransa. This was an English boat plying between Liverpool and Callou, Peru. This boat was pretty well loaded with English; there were a few French and Germans aboard, and one yankee, myself. For the three weeks I was on the water I had sufficient trouble holding my own against this outfit. In my time I had traveled on nearly every country's boats that run sea-going ships and the good Lord deliver me from Mexican tramp steamers and English royal mail boats.

On Christmas Day December 25th, 1911 I arrived in Buenos Aires on the river steamer "Venus". To a person who has never been south of the equator before, this certainly was not Christmas. The flowers were all out, the parks nice and green, everybody had on their summer toggery, and about noon the temperature stood about 100 in the shade. The farmers were busy with their harvest and I just naturally felt when I stopped there at Buenos Aires as if the Company had begun to double up seasons on me.

I went to the IHC offices on Christmas afternoon and found nobody there, so with a few friends I had become acquainted with on the boat, we spent the afternoon investigating the city.

Buenos Aires is the finest city in Spanish America, and at that time there was more wealth exhibited there than you would see in either New York or London. The Avenues and especially the "Avenida de Mayo" is one of the finest drives in the world.

Late in the afternoon we went to a cemetery called Recoletta. In Spanish cemeteries the greater part of the corpses are put in rented graves. After awhile when the relatives' grief grows cold and they begin to forget the departed one, they also forget to pay the rent, in which case the bones are removed from this grave and tossed with others into the corner of a huge building. In this building we saw tons and tons of such bones. There were mausoleums there which undoubtedly cost a million dollars gold. I have been told (and have no reason to doubt it) that there was more wealth exhibited in this Recoletta than in any other similar place of its size in the world. There are thousands and thousands of tons of the finest life size

carrara marble statues and any amount of smaller ones under glass that are placed at the head of the different graves. In fact the Recoletta is more a city of life than a city of the dead.

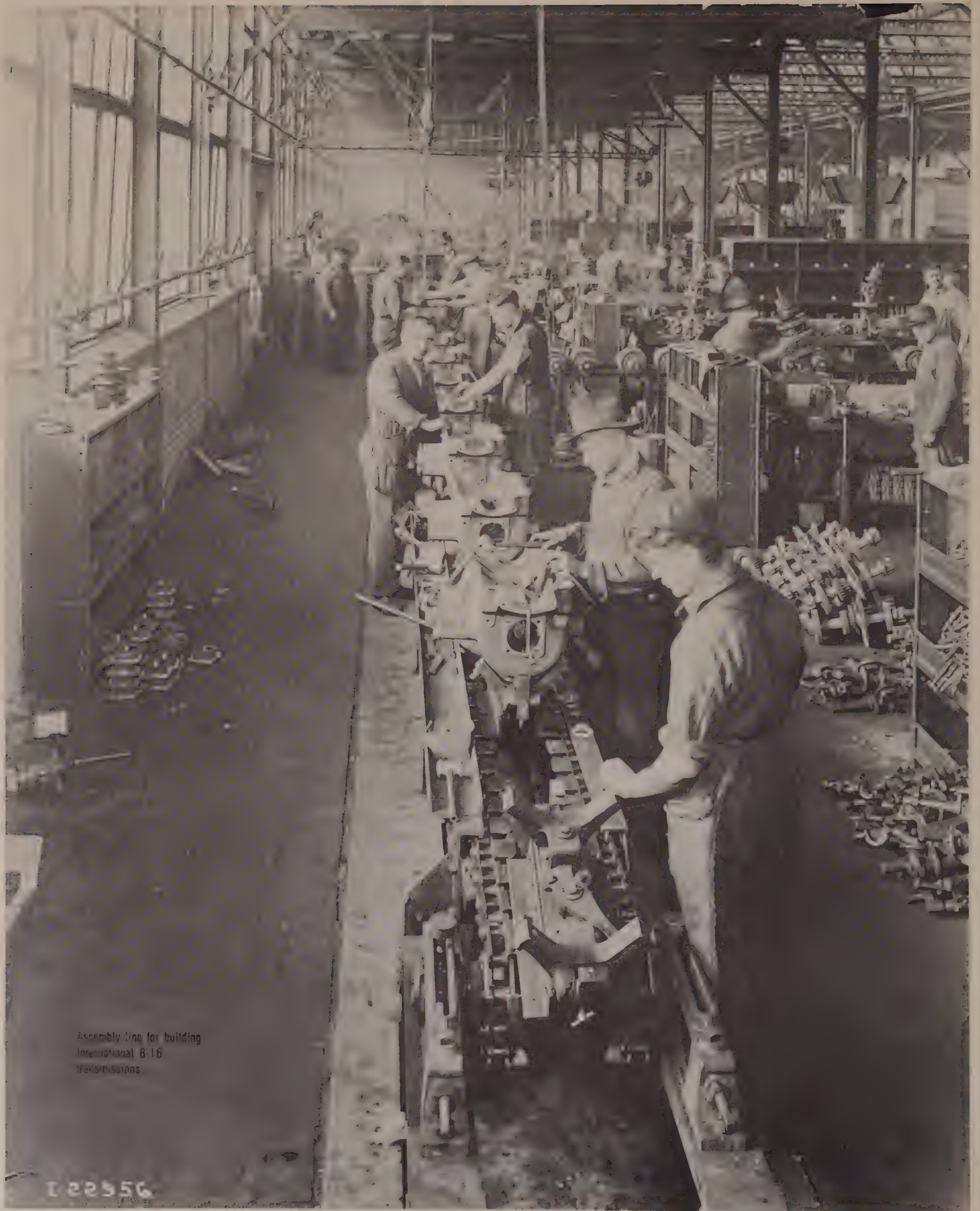
They have as good theatres in Buenos Aires as they have anywhere else in the world, and I think the population is more cosmopolitan than any other large city. They have no regular saloons as the drinks are sold more on a cafe basis. From 8 o'clock in the morning until about 2 o'clock the following morning you will find a band playing in all of the better cafes in the city.

Buenos Aires is about as far south of the Equator as New York is north, but it is close enough to the ocean for the gulf stream to keep the temperature fairly even. In the summer time the nights are cool and pleasant but the days get extremely hot. In the winter time the days are pleasant but the nights get very raw and chilly. I never saw ice frozen in Buenos Aires, but I wore heavier clothing there in the winter than I ever did in Chicago. It is quite damp, raw and cold, and none of the houses are equipped with fires. Consequently the only way for one to get warm is to wear sufficient clothing or go to bed.

On December 26th, 1911, I was transferred from the Foreign Sales Department of the IHC to Ager Cross Y Cia. They were implement importers and handled our McCormick line of binders together with the Mogul line of tractors. At this time we had no kerosene tractor and were handling the Rumely kerosene tractor in South America thru our importers Ager Cross Y Cia. Mr. Fred Heutson, now dead, was at that time Manager for Ager Cross and he gave me a great deal of valuable information before starting me out on the territory.

On January 6th, 1912, I received instructions to go to Clarez in the province of Buenos Aires. I arrived in Tandil on the morning of the 7th and at that time the locomotive engineers went on strike on all the lines in the Argentine, so it was necessary that I hire a team to drive from there to Clarez, a distance of about 70 miles. At Clarez I started the Rumely tractor for our local dealers and then was compelled to wait another ten days before I was able to leave town, on account of the railroad strike.

On the 16th, I decided to go to Buenos Aires if possible. Therefore, I took a coach back to Tandil and as there was still one or two trains running on the main line between Tandil and Buenos Aires I was able to get back to the main office on January 19th.



Assembly line for building
International 8-16
transmissions

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While at Tandil I had the pleasure of viewing one of the seven modern wonders of South America. On the hill at the edge of town were a large bunch of rocks. This hill was possibly 500 ft. high; the topmost rock was set in sort of a natural pocket and by putting your shoulder under the edge of this rock you could swing it back and forth so the top of the rock moved several feet. This was called the moving rock of Tandil, and as this rock was very large, weighing possibly several hundred tons, it was quite a curiosity how it could balance itself so perfectly.

During the latter part of 1912, this rock fell from its pinnacle on the top of this hill and broke in two pieces when it struck the ground about 300 ft. below. The last I heard of this the Argentine government had undertaken to cement this rock together and hoist it back to its original resting place.

On this particular trip Ager Cross Y Cia sent an expert with me, an Irishman by the name of Pat Ryan. Pat was born in the Argentine and knew practically everything about the customs of the people in the country. He confidentially informed me the first night we left Buenos Aires if I did not care to be shipped back to the U. S. in a coffin, that I had better purchase a quart of whiskey and take it along. I found out later that Pat was perfectly right in this because, I have actually had to drink water with wigglers $\frac{1}{8}$ " long in it. Pat informed me that if these wigglers were less than $\frac{1}{8}$ " long to put a little whiskey in the water—if more than that, we were to put a little water in the whiskey. He said that for himself he never bothered about the water at all.

On January 21st, I received instructions to go to a place in Pampes called Cerellas and overhaul a single cylinder type "D" tractor owned by a man named Mr. Lett. Mr. Lett was an Argentinian whose parents were English. He owned several square mile of land, and besides the Type "D" tractor he had four English steam tractors on his farm.

This particular trip is remembered very distinctly on account of the sand storms we had on the Pampes during my stay on Mr. Lett's farm. There were actually times that you could not see ten feet before you. This light, flimsy sand would drift like snow. I saw sand drifts formed in two or three hours that it was impossible for a horse to drag a light two wheel sulky thru. The pampes in the Argentine corresponds to our Panhandle district in Texas, in that it drifts continuously as soon as it has been once plowed. If they get water on this land it is one of the most productive wheat countries in the world. If they do not have sufficient water it is impossible to grow even ordinary sage brush.

The worst pest they have to contend with in the Pampes is the Belgian Hare. Years ago someone got an idea that the Argentine would be a good place to raise rabbits and imported a few Belgian hares. These animals have bred so rapidly that the country is completely over-run by them. Had I not seen this country it would be impossible for me to believe the amount of these animals that roam over this open plain. In riding along on the train I have seen thousands of these little fellows in droves scurrying away over the tracks. The Argentine government pays a bounty of something like \$5.00 a dozen for Belgian hare scalps. Quite a few hunters make a good living shooting and trapping these animals. Nevertheless, the country is swamped with them as they breed the entire year, and unless something is done to exterminate them completely, the Pampes will never be a wheat country.

I was out in camp at different locations continuously until February 14th, when it was necessary for me to go to Bahia Blanca to have my left knee treated for blood poison. This was brought about by irritation caused by a little insect called Beecha Collaral. These little insects correspond to our Chiggers in this country and after getting on you they can make it more interesting than a French Cootie. Ordinarily they would not amount to anything if a person didn't scratch, but in the night when it is hot and these little fellows are bothering, you start to scratch and irritate the skin. Possibly this is the way that blood poison is contracted.



Testing area for 8-16 tractor engines. These engines were hooked to generators to make electricity for other parts of the factory.

1-22552

I found out later that the only way to keep these pests from bothering you was to take a good hot bath and an alcohol rub afterwards. Also while at Tres Lomas I became acquainted with a special brand of sand flea. These little chaps did not bother to bite you but would lay their eggs under your finger nails and toe nails. These would generally hatch out in two or three days, and unless you were extremely careful it would cause the flesh to fester around the nail and the nail would be lost. The cure for this is the same as for the Beecha Collaral—get alcohol under your nails. With all these little drawbacks in this country, the climate is the finest of any in the world. The temperature is exceptionally dry, and I have noticed time and again that when a horse dies and is allowed to lay alongside of the road it does not decompose like it does in northern countries, but dries up more like a mummy, and there is no stench of any kind.

On February 15th, I was sent to Madanos. The word Madanos in Spanish means *sand hills* and there surely were plenty of them in this country. They put you in mind of the dunes of northern Indiana.

At Madanos I got a 25 HP single cylinder Mogul Tractor and delivered it to a farmer by the name of Francisco Faccio who lived about ninety miles from town.

The country was perfectly level and it was only a matter of starting the tractor in the right direction and keeping it going. The first night away from Madanos we stopped at the ranch house. The farmer killed a sheep for us, and their method of cooking it was quite interesting. The sheep was first thoroughly cleaned, then an iron rod was run thru half of it and the rod pressed into the ground. There were no twigs or sticks of any kind in this country, and therefore we gathered up a bunch of Buffalo chips, placed them around the bottom of the stake and set fire to them. The cook had a bottle with a mixture of vinegar, pepper, and salt in it. About every two or three minutes while this mutton was roasting, the cook would sprinkle a

little of this mixture over the carcass. After watching this performance for awhile I came to the conclusion that I didn't want any supper, but after the sheep had eventually been roasted and the fire kicked away from the bottom, I thought I would be sociable and try some of the same. This is what the Argentine cowboy calls *assada*—and it was really good. Therafter whenever I had the chance I certainly filled myself with *assada*.

My greatest trouble was learning to eat it Argentine fashion. An Argentine gaucho, or cowboy, would split a rib off this carcass, seize the meat with his teeth, stretch it as far as possible from his mouth and then with a deft upward stroke of his knife would cut the meat from the bone. I became quite proficient at this with the exception that I always struck down to save my nose.

Practically everybody in camp in that country carries a knife, the blade of which is about 14" long. This knife is used for various purposes; from trimming your corns to letting out the intestines of anybody with whom you may have a difference. It was always a curiosity to me that the little eating houses of the country furnished forks and spoons, but you were supposed to have your own knife.

They use a kind of bread in that country called Gilletta. It is shipped from the cities in 200 lb. bags. One of these biscuits is about the size of a large man's fist and so hard that you would have no trouble at all in knocking a beef down with it. It is practically impossible for a North American to eat these without first soaking them; nevertheless they are very white and mealy inside when soaked and after getting used to them one really enjoys them. The nice part about it is that you can pack these biscuits along with you for months at a time and they never spoil. Another curiosity was the fact that about 90% of the people in the Argentine use Mate. Mate is a tree that grows in Paraguay and Brazil, the leaves and stems of which are gathered and tightly pressed in untanned horse-hides and shipped south to the Argentine. The native takes a handful of this mate, places it in a small gourd and covers it with boiling water. The

young lady of the house is generally the hostess on this occasion and she will bring you this gourd of mate with a small silver tube protruding at one end. You press the protruding end of this tube to the bottom of the gourd and draw the liquid thru it with your mouth. After you have taken two or three sucks at this tube, or Bambilla, you pass it on to your neighbor who does the same.

While I got so I enjoyed mate fairly well while in this country, I certainly did not like the idea of sucking the same tube that a dozen old greasy Spaniards had used before me. Nevertheless, it was an Argentine custom, and I believe that when in Rome we should do as the Romans do. There are very few vegetables planted in this country, so the mate really takes the place of vegetables and is a God-send for the people.

While in the Argentine I made three trips to Francisco Faccio's engine from Madanos. One trip was made on a tractor, one in an express wagon with four horses, and one in a two wheel sulky with one horse.

Now, if you have never ridden in a sulky or on a camel you cannot appreciate that trip. A two wheel sulky hitched to the average horse will keep bouncing back and forward shaking you continuously, and after putting in about ninety miles on one of these things you are perfectly willing to spend a couple of days in bed.

I had a peculiar incident happen to me on my last trip on this tractor in Madanos. I was returning on horseback and was within about twenty miles of Madanos where there was a country store selling anything from a mouse trap to a traction engine. Also the proprietor had a complete supply of all kinds of drinks, but of course no ice. I was fairly well acquainted with the man who ran this place and having put in about sixty five miles on horseback I was covered with dust and thoroughly tired out. I therefore thought I would stop and obtain a glass of beer before proceeding on to Madanos. It might be well to mention here that an Argentine gaucho or cowboy is generally a wild and woolly sort of chap, who is a cross between a Spaniard and a Corrientes Indian. He is absolutely fearless but a perfect gentlemen if handled properly. All of them are fighters and the best way to get into a tussle with one of them is to convey the idea that you are, or feel that you are, better than he is.

When I walked into this store I noticed possibly a dozen cowboys sitting around different tables drinking. I walked up to the counter, purchased a bottle of beer, drank it, and was turning to leave when one of these cowboys came forward and asked me to have a drink with him. Thoughtlessly I told him no thanks and started to leave the place, whereupon he drew a knife and with the words, "you----!!! rich people think you are too good to drink with us"—he lunged at my stomach with his knife. The only thing that saved my intestines from strewing the floor was the fact that I wore a large silver buckle in my belt. The knife cut into this buckle at least $\frac{1}{4}$ ". I was thoroughly surprised at this action because, from my point of view, it was entirely uncalled for. I stepped back and told him if he undertook that again it would be necessary for me to kill him. Either the man was a fool hardy or had too much to drink. At any rate, he made another pass at me with the knife, but as I was looking for him this time I stepped sideways and the point of his knife buried itself in the side of the hardwood counter and at the same time the butt end of my lead loaded riding whip collided with his head. The blow was enough to kill an average ox. Here again is a sample of the honesty of these kind of men. Had this been an American saloon every one of the inmates would have been clamoring for my scalp. The way it was nobody seemed to bother about it and only one man got up and walked over to me and requested that I should not kill this cowboy as he was a good chap when sober.

I found out afterwards that my procedure in this matter should have been that of stopping and having a drink with this man in which case he would have thought himself just as good as I was and felt that I did not think myself any better than he was. In that country a person can get into trouble very easily upon the slightest provocation.

One night in Bahia Blanca a man volunteered to stick a knife into me because he had asked me for a light and I had offered him a match instead of the cigarette which I was smoking. I found out later that my procedure in this matter should have been to hand him my lighted cigarette and also to have taken one puff out of same after he handed it back to me. All law and order except that which you make yourself at that time was unknown south of Bahia Blanca. In that country might was right. If

you carried fire-arms you possibly would never have to use them unless perchance you had some sort of accident regarding their etiquette or collided with a drunken cowboy. There were very few murders and less robbery than there is in the average city of the U. S.

I never had experience with a robber except once south of Bahia Blanca. At this time I went to bed in a hotel in Madanos where there were four other beds in the room, two occupied by native Argentinians and one by an American who was down in Madanos with me. I insisted on having the window wide open, but the Argentinians did not like this idea as they were afraid somebody would come through the window and kill them during the night. Nevertheless, I succeeded in keeping the window and shutters open, and the average robber would not have cared to come into that room had he seen each one of us slip a revolver under our pillows before going to sleep. During the night I was awakened and noticed a man about half way thru the window. I was just getting ready to reach over and bump him on his head with the butt end of my revolver when one of the Argentinians awakening let out an Indian warwhoop and the man fell out of the window backwards and made his getaway.

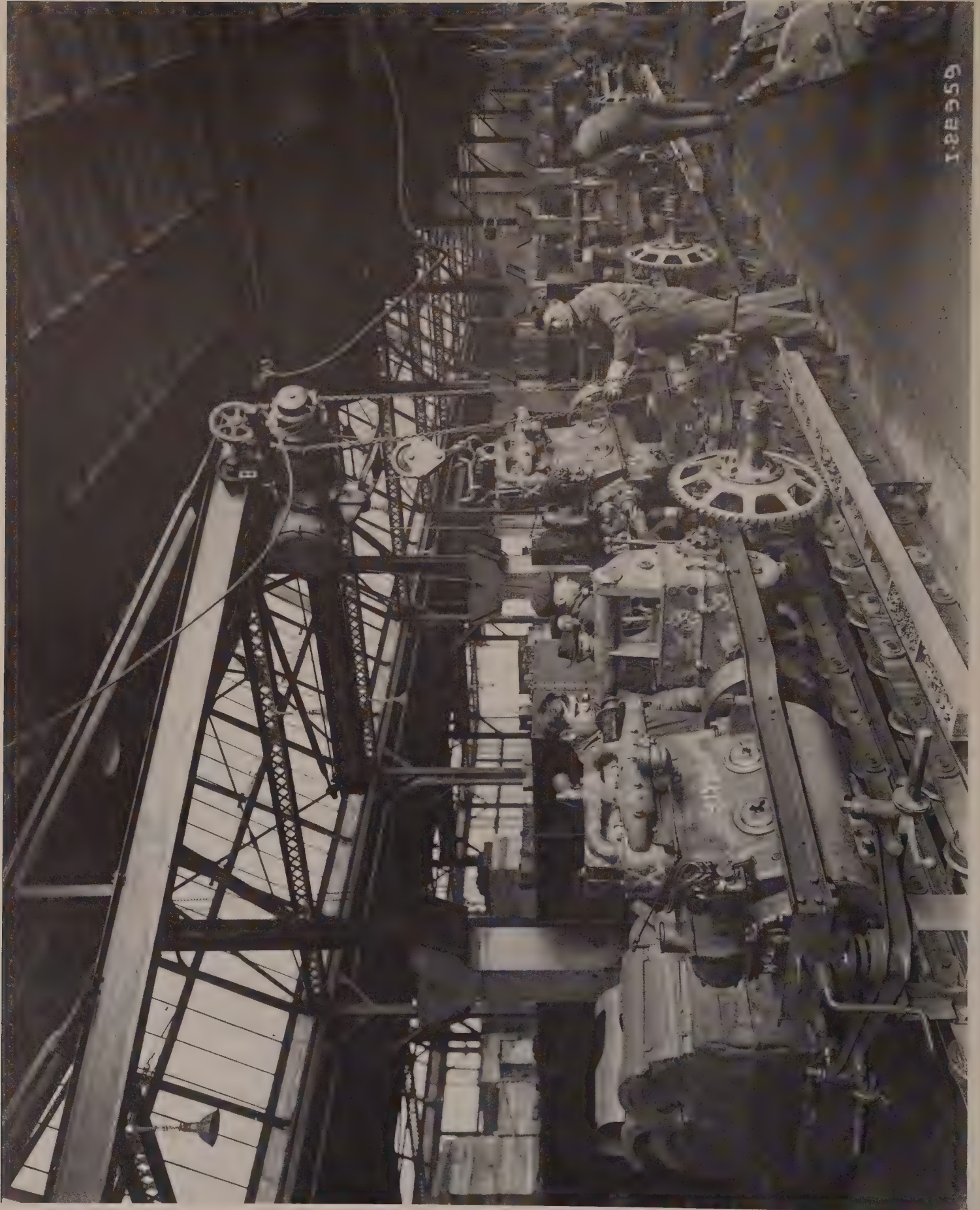
The last man known to be with a murdered man in that country is held responsible for his murder.

In South America they have a day that corresponds something to our Halloween. On this particular day it is permissible to throw water either by the tin or bucketfull on any person you happen to come in contact with. I happened to be in Madanos on this day, was leaning up against the side of the hotel talking to a couple of friends watching the natives try to drown each other. I heard one of the natives casually remark that he was going to duck that big gringo, and as I surmised he would get into the hotel and throw the water thru the window, I moved out to the edge of the road and sat down on the grass. My friends came out there and sat with me and in talking with them I picked up a rock and was tossing it back and forth from one hand to the other. The native who intended to duck me undoubtedly suspected that I was going to use the rock if he did, and as he could not stand the

taunts of his fellow townsmen, he went down to the police station and reported that I had assaulted him with a rock. This was a very serious offense in that country, so the Commandante sent the Sergeant and four policemen to get me. The procession going from the hotel to the police station was comical. The Sergeant was on horseback and armed to the teeth; his four assistants marched behind him in the middle of the road, also armed. I walked down the sidewalk and nobody seemed to care whether I got to the police station or not. When I did arrive the Sergeant informed the Commandante that I was not as desperate a character as they had painted me and after the Commandante had explained to me the customs of that particular day in the country he told me to go back uptown and not get into any more trouble. As I was leaving the station the Sergeant whispered to me that he thought it was worth \$5.00. I then understood why he had pleaded my case so grandly. Three or four times during my stay in Madanos I had occasion to use this Sergeant for different purposes, and I found that the best way to get along in those countries was to call a police officer back into an alley and tip him regularly at least once a week.

If you slip a knife between anybody's ribs down there and it happens that the man dies there won't be much said about it, but if you only injure him and be that vicious to strike a man with your fist you would undoubtedly get five years in the penitentiary.

It is not a law but a custom that when you go into one of those small towns you are supposed to unbuckle your belt and turn your fire-arms over to the hotel keeper. This is to show that you will not create any disturbances while in the town. This I always did, but as a measure of extra precaution I always carried a small automatic in my hip pocket. Mr. Jesse Thebe and I returned to Madanos one evening when there was a slight rainfall. We turned our fire-arms over to the hotel keeper as we always had done and went to our rooms to change to dry clothing. In making this change I completely forgot to put the pistol in my hip pocket and went out to the dining room for supper. I noticed a man sitting in the corner of the dining room who did not understand Spanish and was trying his best to make the waiter understand



Workers install engines in 8-16 tractors. Note all bolts, washers, etc., appear to be stored in wooden bins along the line where they are readily available to the workers.

1-28-59

what he wanted to eat. He was a man about fifty years of age and I noted by his dress that he was an American. I walked over and asked if I could be of any assistance to him and the old man surely was glad to hear somebody speak his own language. His name was Vosburg and he was employed by the Birdsell Implement Company. He had only been in the Argentine about a week and could not speak a word of Spanish. Mr. Thebe and I sat down at his table and after supper walked outside the hotel and were standing in the middle of the street talking. The street was not paved and the slight rain had caused a little puddle of water in front of the hotel. The moon was showing through rifts in the clouds and it was indeed a very pleasant evening. While we were standing there talking, a man came out of the hotel door and I noticed that he staggered. I mentioned to Mr. Thebe that the man had a fair sized load, and after passing a few words back and forth, I forgot about him until Mr. Thebe mentioned the fact that he was coming out our way and that he had a revolver in his hand. I felt the best way to get rid of him was to make him believe we did not understand Spanish. This did not seem to work very well because he shoved the revolver in my face and told me with an oath that I should speak Spanish. I spoke it then with the best of my ability and with some speed, but it did not seem to pacify the fellow. He insisted that we had been talking about him and I could readily see that in his condition he wanted to fight. At this moment I happened to think of the gun that was in my hip pocket hanging in the room and realized that it was worthless to me. I therefore told Mr. Thebe to back off from him on an angle and I would do likewise. He could not face both of us at once, but he was just sober enough to back off to keep the angle wide so that he had us both in front of him.

At this moment Mr. Thebe thought discretion was the better part of valor and beat it for the hotel. As he went thru the hotel door the fellow shot at him. Luckily he missed him and before he could fire again I turned at him and had him pretty well trampled out of sight in the mud below. The police came and took him to the station, locked him up for two hours, gave him his gun and told him to go home. So you can understand that about all the law in this country is what a man makes himself.

On March 28th, 1912, I was again transferred from Ager Cross Y Cia back to the IHC and was sent from Buenos Aires to Montevideo, Uruguay with instructions to report to Hijos de Juan Risso. These people were handling our Titan line of tractors under the name of Champion. A farmer at LaLatta owned one of these Tractors which had been giving him a slight amount of trouble. One of the Risso boys and I went out to look this tractor over and I was agreeably surprised at the way this young man took to the work. His father was worth at least a million dollars and was one of the largest importers in Montevideo.

Nevertheless, he dug into this work and when I returned to Buenos Aires on April 8th, I was thoroughly convinced they would have no more trouble with that particular engine as I felt sure this young fellow could handle the work nicely.

On April 7th, our South American Manager, Mr. J. W. Keough sent Mr. Thebe to Riviera, Uruguay to instruct some operators in the care and operation of a 30-60 Titan Tractor. Riviera is in northern Uruguay just on the edge of the Brazilian border and is the wildest place it has ever been my luck to strike.

On April 16th, we received word that Mr. Thebe would like to have me go to Riviera and assist him. I knew that Mr. Thebe was a thoroughly good operator and felt that it would take something more than engine trouble to make him ask for help. Therefore, on the night of the 16th, I left Buenos Aires by boat, went to Montevideo and late on the night of the 17th, arrived in Riviera. On the morning of the 18th I took a team and drove about forty miles to the plantation where Mr. Thebe was located. After sizing up the ground I did not blame him one particle for not wanting to be up there alone. There never has been any particular amount of peace between the Brazilians and Uruguayans on the border, and it seems that Mr. Thebe had got in wrong with the operator on the engine who was a Brazilian and had slightly favored the plow man who happened to be a Uruguayan.

I did my best to straighten out their trouble, got them going and went back to the camp. Mr. Thebe and I were sitting at the camp when we heard the engine quit running. We thought we would stay away from them awhile and see if they were able to start up again without our assistance. Not hearing the motor about an hour later we came to the conclusion we would go down and help them out of their trouble. When we arrived on the job it appeared that the engineer and plow man had had an argument. The engineer had shot the plow man and stepped across into Brazil. All there was done about it was the fact that we buried the plow man where he had fallen, hired a new operator, a Uruguayan this time, and went back to work.

Riviera is getting pretty well up into hot countries, and I think I saw more different species of snakes in that country than I have ever run across anywhere else. While on this trip I went to Tuacaurenda to look over a 30-60 Titan that a man was using to pull charcoal to town. He had two wagons behind this machine with about three ton of charcoal on each wagon. The only reason he could not pull more was because he had to go thru a river, but among all the satisfied customers I ever saw he was the greatest booster.

On May 5th, following instructions given me by Mr. Keough, I left Buenos Aires for Valparaiso, Chile. I was accompanied on this trip by Mr. Safft who was at that time cashier for the IHC at Buenos Aires. The trip on the railway between Buenos Aires and Valparaiso is wonderful. You leave Buenos Aires about six o'clock in the evening and you get to Mendoza about 7 o'clock the next morning if you survive the dust and dirt of the travel across the Pampas. It is practically impossible to make this trip in the daytime, and while the sleepers have double windows and everything possible is done for the comfort of the passengers, nevertheless the trip is a complete torture the entire distance until you strike the Andes Mountains.

We crossed these mountains on the railway on May 6th. The sights are the most wonderful of any in the world. From about 6 o'clock in the morning until about 9 o'clock you are going thru the foothills of the Andes, which are heavily wooded and green. About 9 o'clock you come out of a canyon above the timber line. By 10:30 you are in a region of perpetual snow. The railway is so steep in places that they have cog wheels on the engines and a rack in the center of the track. At these places the train will travel at a speed of not to exceed three miles per hour. It took three engines to push two coaches over the mountains on this train. By 2 o'clock you have reached the top of the mountain, which is some 16,000 ft. above sea level. At this point, unless your heart and lungs are very strong you would not be able to go outside the coach to walk from one end to the other on account of the rarified atmosphere. The railway does not go completely over the mountains as there is a tunnel about four miles long thru the peak. After you have crossed the top the only thing you need steam for is the air brakes until you have arrived at Juncal on the Chilean side. At Juncal they again transfer you to another train and in a couple of hours you are in Valparaiso.

If you were to cross the Andes Mountains every month in the year you would probably have to make at least eleven trips on mules, as the railroad is completely snowed up or taken away by avalanches eleven months of the year.

At Valparaiso I reported to the office of Savvada Bernard Cia. They furnished me with a German by the name of Hans Brighton to go to a place called Mellapilla to start a 30-60 tractor owned by a man there. I was in Mellapilla until June 1st when I went to Talcahuna to get another tractor that was to be delivered to the same man. We loaded this tractor in a barge to bring it ashore, and as Talcahuna has rather a treacherous harbor, and a norther was blowing pretty severely, the tug crew became excited and cut the lighter adrift. It floundered around in the waves for a few minutes and then sank. The next day I went out in a row boat and located the tractor which you could see very plainly under about 22 ft. of water. I started in to make arrangements to have this tractor raised, but found that the insurance company would not let us touch it, so I therefore went back to Mellapilla to finish my work.

On June 9th, while out on the plantation we had a very severe earthquake shock. Earthquakes in Chile are quite a common every day occurrence, but this one was exceptionally severe. A row of cottonwood trees about two miles long extended from the ranch house to the opening of the field where we were plowing. About half way along this row of trees the ground seemed to tear itself completely apart and this line of trees was offset at least three feet. I never before thought it was possible for the earth to wrench itself in such a position. That night before going to bed in Mellapilla Mr. Brighton informed me of all the horrible earthquakes he had seen in Chile during his time there, and I noted myself that the greatest number of people who were injured in earthquakes were injured just as they ran out of their building, caused by the roof or coping falling on them and I had thoroughly convinced myself that no matter how hard the ground shook I intended to stay in the house.

This night Mr. Brighton and I slept in the same room in a frame hotel on the second floor where there was a porch leading from our room. The room was rather large and our beds sat in opposite corners. About 11 o'clock my bed started to squeek as though I were turning over. I did not pay much attention to it as it was only an ordinary tremble, and about 11:15 the same thing happened again. Nothing occurred from then on until about five minutes to 12, except that I could hear Mr. Brighton rolling in his bed every once in a while. About five minutes to 12 my bed started to waltz across the room. Mr. Brighton screamed "earthquake" and ran for the door. Just as he got on the porch it gave way over him, precipitating him to the earth below. Luckily he was more frightened than hurt and with the assistance of a ladder we finally got him back into the room. Any person who had never been thru a real earthquake shock would not believe that my bed traveled the entire length of that room, but it is a fact that when we eventually got settled down and ready to retire again my bed was setting right against Mr. Brighton's.

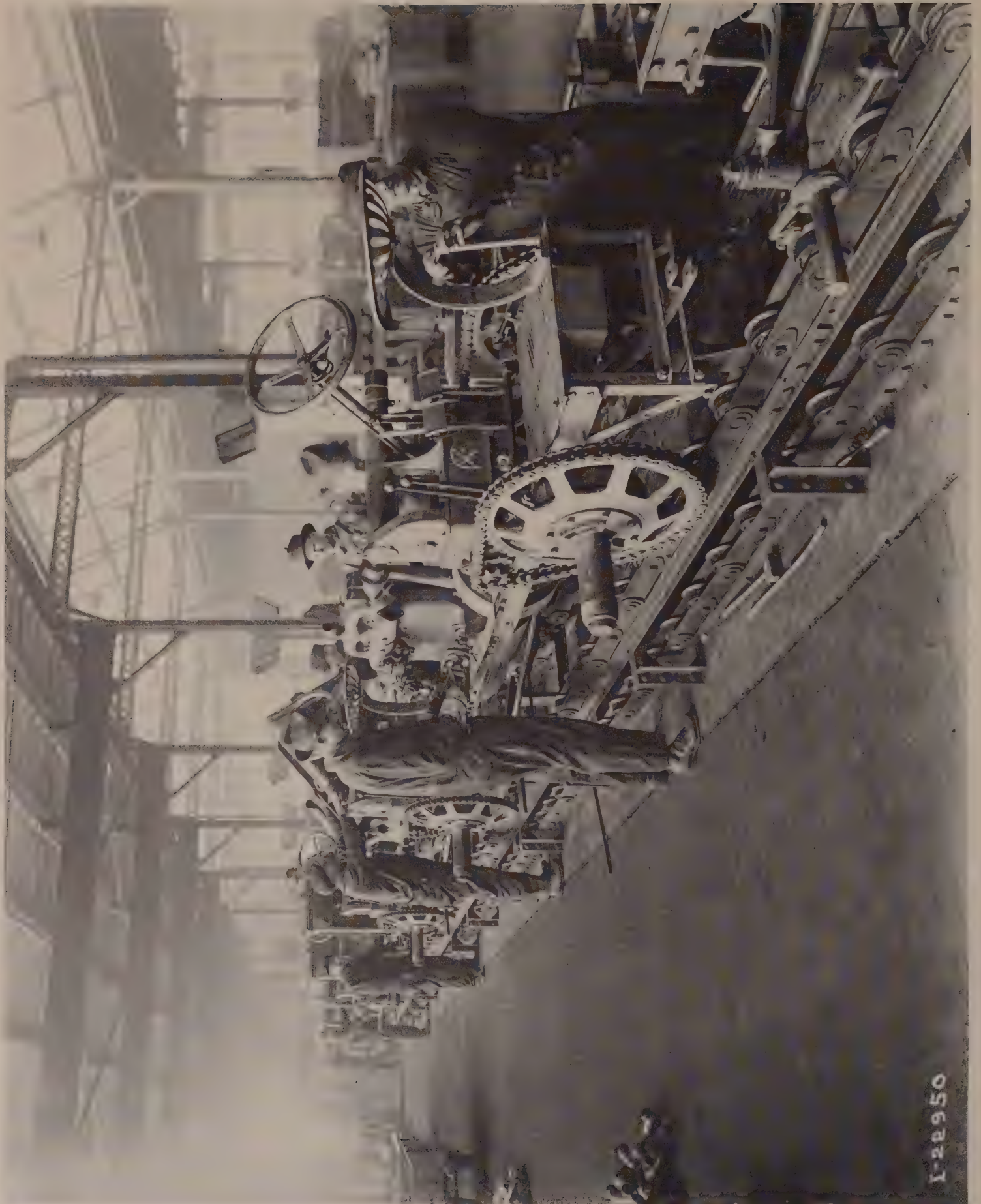
On June 11th, I left Santiago with a piston and connecting rod for a 25 HP type "D" tractor located about sixty miles inland from Sliva Scorva. By leaving the train at Mellapilla and going overland I could make this trip in twelve hours, but by taking the train to Sliva Scorva, it

would take me at least three days. I had been over this road before so I therefore hired two mules, loaded the piston and connecting rod on one, myself on the other and started over the mountain pass. The Andes Mountains on the Chilean side are exceptionally steep, and on this particular trail there were places where it was a sheer fall of 1000 ft. In many places this trail was not more than three feet wide hewed out of the solid rock of the mountain. At one of these places, for some unaccountable reason, the mule carrying the piston and connecting rod, lost his footing and fell over the precipice. I think he fell possibly 500 ft. before striking the shelving ledge of the mountain and then rolled and dropped at least another 3000 ft.

Through my field glasses I observed that the piston had bursted and the connecting rod bent in its fall. The mule, of course, was dead so I did not undertake to salvage any of the material. It is very seldom that one of these mountain mules lose their footing, but at times they will get frightened at small pieces of gravel and rock rolling across the path, and I presume this is what made my mule fall. It is great sport at such a place to roll huge rocks down over the side of these mountains, but when you see a live mule going over and realize what it would mean if you were on his back, it makes you feel rather dubious about taking these trips.

Nevertheless, I had been recalled to Buenos Aires so I returned to Valparaiso, and on June 13th, I again made this trip across the pass successfully. I think one of the prettiest sights I ever witnessed in South America was the sun coming up over the snow-capped Andes Mountains just back of Santiago. The mountains look as if they tower immediately over the city, while in fact it is a good forty miles to the foothills. The snow on these peaks is perpetual. The mountains thus protect the city and the grass is green practically the entire year.

On June 19th, I took the R.M.S. Oriana from Lota to Montevideo. The word "Pacific" in Spanish means peaceful but I do not understand where or how they could apply this word to the Southern Pacific. The first two days and nights out from Lota we ran into one of the worst gales it has ever been my experience to be in. I was informed by old sailors that the Southern Pacific is never really



Another view of the 8-16 assembly line. The 8-16 appears to be the first tractor IHC built using an automated assembly line.

L-22950

quiet. This I presume is because it is exceptionally deep. It is always my luck to get sea-sick when I first board a boat, and I find that the only cure for this is to walk until I am completely tired out. After putting in two days and nights walking with occasional snatches of sleep in between, I went down into my stateroom the third morning out and laid down completely exhausted. I had just dropped into a doze when I heard a terrific crash, the boat appeared to quiver, throw itself sideways, and then to all appearances it was standing still. I presumed we had run on a reef, of which there were many in this part of the ocean, and without waiting for my baggage, I grabbed a life preserver and ran on deck. I was much surprised to find that we were in a very narrow strip of water that was absolutely still. In fact, we had turned east and were in the Straits of Magellan. When they rounded a point to go into these Straits the ship tipped quite a ways to the starboard and upset quite a few things in the pantry. This was the crash I heard.

It was certainly a great relief to be in still water after the two days and nights we had put in on the Southern Pacific. One cannot appreciate the magnitude of the Straits of Magellan unless they go thru them. There are places where the water is two or three miles wide, and then possibly you will run into a little bay ten miles wide. Then you will come out into a very narrow strip of water not over 800 ft. wide with the sheer walls of the mountains rising two or three thousand feet on either side. While going through the Straits I saw the only two volcanoes that were then active on the western hemisphere.

On June 24th, we landed at Punta Arenas. This is one of the largest wool centers in the world. I think possibly some day this may be a farming country, but at present it is adopted entirely to sheep raising. It was necessary that we lay over two hours more in Punta Arenas than the mail boats generally stop there, on account of a severe snow storm. Here again the change of seasons was brought forcibly to my mind. When I went to Chile I did not expect to encounter such severe cold weather and consequently did not have any heavy underwear with me. In Punta Arenas I put on two suits of underwear and two pair of pajamas under my clothing to keep out the severe wintry winds of June.

After leaving Punta Arenas we wended our way on thru the Straits of Magellan to the Southern Pacific. It was a curiosity to me to know how it was possible to steer an ocean liner the size of the Oriana thru some of the treacherous curves in these Straits. We saw any number of steamships that had undoubtedly been on the reefs for years no doubt run there during fog or snow storms and abandoned.

Upon arriving then in the Atlantic Ocean we sighted an iceberg. We did not get within eight or ten miles of this iceberg, but the Captain of the boat I was on estimated that it was at least twenty-five miles long and 1000 ft. above the water at its highest peak. The wind blew from the berg toward the ship, and the stench from the decaying fish and vegetable matter in this ice was terrible, also the wind blowing over the ice toward the ship was extremely cold.

On June 28th, I landed at Montevideo and immediately reported to P. Mane and Cia. This firm furnished me with an assistant and I went to Canelonex and overhauled a type "D" Champion tractor for a farmer there. The only disturbing feature of this trip was the fact that the assistant sent with me was a raw Englishman and I possibly was too patriotic in wearing an American flag on the 4th of July. I returned to Montevideo on the 6th and again reported to Hijos de Juan Risso. They were getting a 45 HP Titan Tractor ready for a tractor demonstration at the College of Toledo, Uruguay and it was necessary that I thoroughly overhaul this tractor for this test.

We found that the ground was entirely too wet for any kind of tractor demonstration, so on July 15th, I again returned to Buenos Aires.

On July 16th, I unloaded from Buenos Aires a 50 HP Vertical Two Cylinder tractor that had been manufactured at the Tractor Works for South America trade. This tractor was taken to the depot on July 19th, shipped to Cascallares and on the same day I again returned to Montevideo to conduct the test at Toledo. The ground was still too wet and on the 22nd I returned to Buenos Aires at the request of Mr. Keogh to give him some information regarding the tractors at work at Madanos. I returned again to Montevideo on the 27th

and the demonstration at Toledo was held on the 28th, 29th, and 30th. Our Tractor came thru with flying colors and to show their appreciation thereof the Hijos de Juan Risso people made me a present of a silver, gold lined cigar case, which I value very highly.

Returning to Buenos Aires on the 2nd of August I went immediately to Cascallares to start the 50 HP vertical engine and conduct a test on same. This appeared to be the most powerful engine we had manufactured up to this time. The only trouble about it was the excessive vibration. It was practically impossible for an operator to stand on this tractor more than two or three hours at a time and operate it. At this particular place I found partridges thicker than anywhere else in the world. In riding across the field twice, a distance of about one mile, I shot a bushel basket full of these birds from the cab of the engine. In fact they were so thick that it was impossible to make them fly and it was more like murder than sport to shoot them on the ground.

Experts who think they have a hard time of it in the U. S. should have had our sleeping quarters at Cascallares. From August 3rd to August 22nd, or for nineteen straight days we had nothing but raw sheepskins to sleep on and cover ourselves with. The grub was real good but they did not appear to have such a thing as a fork or a spoon at Cascallares, and had it not been for our hunting knives we would have been without knives also. Our sleeping quarters were exceptionally cold and practically every morning we woke up with two or three inches of snow on the ground. Nevertheless, it would warm up quickly, the snow would all have disappeared by 9 o'clock, leaving a nice beautiful slush to tramp around in the rest of the day.

On August 23rd, I felt that the Italian I had been instructing on this work was thoroughly capable of handling the engine, and therefore went to a place called LaDorite where a man by the name of Juan Fraizer owned about forty-five square leagues of ground. Mr. Fraizer and his wife were both Argentinians of English and Spanish descent, and were undoubtedly the finest people it was my privilege to meet in the Argentine Republic. They were both educated in France and did not

have the over-bearing way to them that is characteristic of the English and American owners in the Argentine. Mr. Fraizer had purchased two (2) 45 HP Mogul Tractors and was exceptionally well pleased with them. He was a genuine sport and his wife a typical sportswoman. Nothing seemed to please either of them more than to take a rifle, get on horseback and hunt ostriches or other game which was plentiful on the plantation.

On September 3rd, I went to Neuquin to investigate a tractor made by the Stokes Motor Plow Company for Mr. Keogh. This was a German made machine and Mr. Keogh seemed much interested in it. While in this town I took off ten days to go hunting. I think this is one of the finest countries in the world to hunt in. Guanaco are as plentiful here as rabbits are in Illinois. It is an animal whose back stands about 4½ ft. high and whose head and neck allow him to reach up to branches on trees nine and ten feet high. It was a species of Giraffe and speedier than a deer. These animals are exceptionally hard to kill, and I have seen them run two or three hundred yards after being shot and eventually would drop over and die without a struggle. It appeared that as long as there was any life in them they would continue to run. They roam the plains of Neuquin something similar to the way our Buffalo did here fifty years ago. There are thousands of them and the province of Neuquin pays a bounty of \$5.00 Argentine paper for the scalp of each Guanaco. On this trip I killed two mountain lions, the skins of which I still have and am very proud. Besides these we shot numerous other small animals and birds. Among the most beautiful birds in this country are the Flamingos. These are exceptionally hard to get close to, but with a high powered 8 m.m. rifle, I was lucky enough to get one Flamingo.

On September 14th, Mr. Keogh sent me to Ascension, Paraguay, to look up tractor prospects and investigate a special kind of timber land. On the 18th day of September we had three Revolutions in Ascension. The original President was deposed, another took his place and was gotten rid of, and still another one came which, as far as I know, was still President of Paraguay when I left on the 24th.

Paraguay is one of the most wild and woolly countries in South America. They have been a warlike race of people ever since the Spaniards settled there, and these warring activities have reduced their male population so that they claim there is only one man to every twenty-two women in Paraguay. My experience with the Paraguayans led me to believe that they were perfect gentlemen and that if you would meet them half way they would go out of their way to accommodate you. They certainly treated me great while I was there. For those who are interested I might mention that the Paraguayan women are next to the finest looking women in South America. They are a dark Spanish type and I presume that 90% of them are half Indian. They are all tall and wiry, unlike any other race in that country. The most beautiful women in South America are the Uruguay and especially in Montevideo. They are nearer a pure Spaniard.

On March 27th, I was informed that the engine which sank in Talcahuna harbor had been raised and was ready for me. I therefore took a train to Mendoza and hired pack mules to take me across the Andes mountains. We were able to take the train into the countries as far as Punta Del Inca. This means "Bridge of the Incas," and is a natural bridge that spans quite a chasm at Punta Del Incas. Here are some of the finest springs in South America and a health resort is located there. It is operated by an English syndicate and they certainly know how to charge.

From Punta Del Inca we took mules over the top of the mountain and down to Juncal on the Chilean side. I don't know of any finer sport than a trip across these mountains on burros. The little animals are so small that I would have to raise my feet to keep from dragging on either side of the burro. Nevertheless, they will take you at a fairly good speed up one side and down the other side of these mountains without seeming to tire at all. As these mountains are supposed to be full of bandits the guides will not take a party across unless there are at least twenty five passengers. On this particular trip we had several Englishmen with us and each man seemed to have half a dozen trunks. One particularly comical incident on this trip was when a burro with two trunks lost his footing and slid down an incline probably 1000 feet, that was not exceptionally steep. First the burro would be on top and then the trunks. Eventually one of the

trunks opened up, left a high hat one place, a dress suit at another, and kept on stringing the Englishman's wearing apparel the entire way down this incline. When they finally landed at the bottom the burro was laying on his back like a mud turtle and could not roll over on account of the trunk on his side. The Englishman did not seem much worried over this, because as they gathered up his stuff, he merely remarked that if the burro had twice as far to go he probably would have bursted open the other trunk.

Another incident: a young Chilean girl coming home from school was riding ahead of me and slipped from her burro backwards. Her head broke thru the crust of the snow, but we finally extracted her from this position and placed her on the burro again, and she took the incident as good sport. Some of the places where we went down with these mules were so steep that the mules would place their hind feet in between their front ones, sort of swing on their haunches and start down long grades. If allowed their head they would always bring you to the bottom right side up. If you undertook to try steering them down these places, nine times out of ten when you reached the bottom it would be the mule instead of you on top.

Some people in our party when we got near the peak of the mountains thought it would be a humane act to get off and walk allowing the burros to proceed by themselves. They soon changed their minds about this because a person not used to that rarified atmosphere would burst a vein at the very slightest exertion.

Upon arriving in Valparaiso on the night of the 28th of September, I found the entire city excited over a prophesied earthquake. It appeared that some prophet had told them there would be an earthquake this particular night, and had predicted the weather conditions every day for a month previous. Whether he knew anything about it or not, the fact remains that his weather predictions came true daily, and he had the people worked up to a pitch where they wouldn't go in their houses. He even went so far as to prophesy that it would begin raining at 9 o'clock in the evening and that the earthquake would happen before midnight. True to his prediction, about five minutes to nine the rain came down in torrents. Standing in the hotel window I saw men and women leading little children around in the rain



Tractors coming from the paint tunnel. Notice man dumping fuel in tank so tractors can be driven off the line.

afraid to go in their houses. This might seem foolish to the ordinary individual, but if a person had been thru the earthquakes that the people of Valparaiso have and was naturally superstitious, you could not blame them for being frightened. For myself, I did not anticipate an earthquake and was not disappointed. It cleared off about 11:30 and the rest of the night was beautiful. The city authorities must have expected an earthquake as bad as the people because the bands stayed out and played in the park during the rain and until midnight so as to keep the people as much as possible in the streets.

On October 1st I again went to Mellapilla and stayed with the 45 HP Tractor there until the 15th. This was on account of some red tape with the insurance company and they would not allow me to touch the engine that was on the docks at Talcahuna.

On October 4th, we were plowing in some low marsh land when the 45 HP Titan Tractor dropped in up to its frame all around. The owner of the tractor told me to let it set and he would bring a yoke of oxen to pull it out in the morning. I told him I would let it set but suggested that he bring twenty yoke of oxen to pull it out. He felt positive that two yoke could move it out, but after hitching on six yoke, or twelve oxen and not being able to budge it, he sent to the ranch house for longer cable and got all the oxen that appeared to be in sight. After he had them lined up on this cable, I counted them, and there were just nineteen yoke or 38 oxen hitched to the cable. Of course, it was impossible for them to move in the condition it was in, and I suggested to him that we start the tractor and it would help itself. I don't think any of these 38 oxen had ever heard an internal combustion engine explode, and neither do I think it was possible for them to pull it out of the hole if they had not all been thoroughly frightened, but the way it was with the help of the engine it came out, and after we got all the oxen untangled we found there had only been seven yokes broken.

On October 16th, I left Mellapilla and went to Concepcion. I found that my tractor had been setting on the docks for practically six weeks after

being submerged in the water for about the same length of time. The salt brine had even removed every particle of paint from the tractor and had rusted it so that not a working part would move. After tearing the tractor completely apart, I had to use a fifteen ton screw jack to force the pistons out of the cylinders. I never saw as badly rusted up a mess in my life before. I finally got this tractor running to the satisfaction of the man who had purchased it for about one fourth of its original price, and on November 1st, 1912, I sailed from Valparaiso to Panama.

On November 4th, we transferred from the steamship Orena to the steamship Chile at Ballao, which is the Port of Lima, Peru. After getting on board the steamship Chile I began to realize that the royal mail boats were not so awful bad, but the Chile being a tramp steamer stopped at every little place along the way and took on some of the filthiest looking passengers that one would wish to have on the same boat with him.

After working slowly up the west coast we landed at Panama on the 11th day of November. I stayed four days in Panama around the canal zone and as this was just before the water was turned into the canal I had a good chance to observe all the work on this big ditch. I had been in Panama about eight years previous and was greatly surprised. At this time there were about 40,000 employes working on the canal, and I presume about 30,000 of these were Jamaica and Barbados negroes. Panama itself is a beautiful city, if you like the Spanish type of cities, but there was more vice there than in any other city I have ever been in.

On the 14th of November we crossed the Isthmus of Colon and took the United Fruit Company's steamer Parismina to New Orleans. This was the first time I had been on a real liner, thoroughly up to date, for a year, and I certainly could appreciate it. This company's steamers are all painted white throughout and the food as fine as you can get in any hotel in Chicago. We faced a head sea the entire way through the Caribbean Sea until we struck the Gulf of Mexico, but a person can put up with a very rough sea if he has a comfortable up-to-date bed. This trip was uneventful and we landed in New Orleans November 20th. Left New Orleans November 21st, and arrived in Chicago November 22nd.



H.B. Morrow, superintendent of tractor works, with the new International 8-16.

I was married in December 1912 and rather anticipated that the company would find me a place so I would not have to travel any longer. Nevertheless on March 12th, 1913, Mr. Johnston called me in his office and told me to go to Wichita, Kansas where we were then experimenting with several new type of tractors. During my stay in South America the company had changed the 45 HP type of engine to 30-60, had put on a throttling governor, and increased the diameter of the cylinder. They had also brought out a smaller light tractor which they called a 12-25. This was also a two-cylinder opposed motor, but had high tension ignition. Mr Joe Kane had built a four wheel drive type of tractor at the Tractor Works, and Mr. Harry Waite had brought out a high speed four cylinder tractor at the Deering Works. Also

Mr. John Stewart had brought out a couple of new types of light four cylinder tractors. This together with our standard make of machines and the 50 HP vertical tractor similar to the one I had just tested in South America were near Wichita at a place called Valley Center to be tested.

I was with these machines, together with Mr. Waite, Mr. Engstrom and Mr. Kane until May 2nd, 1913, at which time this entire outfit was shipped back to Chicago and I was sent on to Oklahoma City. From there I was sent to Topeka, Wichita, Hutchinson, and Emporia, finally returning to Chicago on May 30th.

On July 9th, I went to Richmond, Va. to instruct the experts there in the care and operation of the new 12-25 tractor. From there I was sent to Covington, Ky., and back to Chicago July 19th. On July 20th, I was sent to Sioux City to operate a 30-60

tractor in a contest at LaMars. From Sioux City I went to Redfield, S.D. where I installed a fifty horsepower stationary engine on an irrigating system, and then back to Chicago on August 6th.

On August 18th, I was sent to Minneapolis to install a complete electric lighting outfit at a State Fair. On this work Mr. Johnston gave me Mr. Cameron and Mr. Thompson as assistants. This was when the company first began to think about putting in municipal lighting plants, and the tent in which this was installed was 75 x 150 ft. and 2000 lamps were placed in this tent. It was the main attraction of the Fair grounds at night, because from a distance the intense light made one think that the tent was on fire. After this work I returned to Chicago on October 8th, and on the 15th, I was sent to Aurora to assist in experimenting with the new 12-25 tractor. I was taken from this work on the 22nd and sent to Eldred, Illinois, to where a man was trying to operate a 25 HP portable engine on a circular saw, cutting railroad ties. It appeared that when the carriage on this saw went through the log, the throttle valve would not open quick enough, and by the time the throttle did open the speed of the flywheel was down to such a place that the engine could not regain speed and would naturally die.

To remedy this trouble I put a lever on the throttle valve on the engine with a string running up to the head sawyer. Then when the log was about a foot from the saw, the head sawyer would throw the throttle wide open on the engine, thus giving them plenty of speed to carry the saw completely through the log.

On June 9th, 1914 I was sent to Lake Geneva to the Ceylon Court Farm. This farm was owned by Mr. J. J. Mitchell, who is one of the directors of the IHC. I was sent up there to measure the building for an electric light plant, of which we shall hear more later.

On June 17th, I was sent to Atlanta, Ga., where a man claimed he could not pull five ton of fertilizer on a wagon with a 12-25 tractor. I was able to demonstrate that it would pull fifteen ton on three wagons on high gear where the roads were level, and it would take the three wagons up a fairly reasonable incline on low gear.

Returning from there on July 16th, I again went to the Ceylon Court Farm and installed an electric light plant complete with batteries for Mr. Mitchell. This work was not only installing a new plant, but was also digging out old wires that had been grounded in different walls, and giving the whole lighting system a complete over-hauling. I was at this work with short runs to different places in between until September 30th.

On November 4th I was sent to Columbia, S. C. where a man had a 15 HP stationary engine in a cotton gin which he claimed was continually burning out bearings. After working on this particular job for a week I found that the man had a habit of opening the crankcase and throwing a bucket of cold water into the same to cool off the crank bearing. This, of course, would chill the journal and the bearing would seize. I stayed on the Columbia territory until December 12th, when I was transferred to Knoxville and returned to Chicago on December 23rd.

On March 1st, 1915, I was sent to Comfry, Minnesota, to ascertain why a 25 HP stationary engine there would cut out a cylinder every two weeks. I stayed on this job and returned to Chicago on the 12th, thoroughly satisfied that I had overcome all their troubles. On April 12th, I went to New Hartford, Iowa and installed two units of 25 and 15 HP with a 240 volt AC generator in an electric light plant for Mr. C. P. Dodd, together with complete wiring of the town. I returned from this work on April 29th, and was informed that the electric light plant at Comfry Minnesota was still giving them trouble regarding the wearing out of cylinders. I went back to Comfry on the first day of May and stayed there until May 12th. Here I experienced another curiosity.

After doing everything possible to eliminate the grinding effect of these cylinders, I came to the conclusion there was some foreign substance in the water that was causing the trouble. They were using water for same from a deep well that was run into a cistern. The water looked nice and clear and had very little lime in it, because it hardly corroded the water jackets at all. Nevertheless I got a large chamois skin and a barrel and filtered this entire system and got very nearly a bushel of quick sand out of it. This quick sand seems to stay in the water and was not noticeable until the water was filtered.

After discontinuing the use of this water we had no more trouble with the engine at Comfry. Aside from small runs to take care of the electric light plants we were now installing, I had no trouble worth mentioning until July 7th, when I was sent to Paris, Kentucky on the double quick. It appeared that they had a tractor at Paris on which they would lose sale unless someone got there quickly to make it operate properly. I went to Cincinnati and took an auto from there to Paris and arrived in the field just as the operator found out that one of the spark plug wires was broken inside the insulation. Consequently we did not lose the sale, but I had a long trip for nothing.

From July 21st to October 28th, 1915, I was with the St. Louis branch house. At this time, St. Louis was trying awful hard to sell our 30-60 Mogul Tractors to the different counties in Missouri for road making. From November 1st to the 28th, I was with the Richmond, Virginia territory on small stationary engines in flour mills.

From December 1st to 14th, I was overhauling a battery of three 50 HP engines in an electric light plant at DeGraff, Ohio. This plant had given us considerable trouble with the noise from the exhaust and this was eliminated by bringing the exhaust down and putting it in a pit filled with stones, in which a spray of water was constantly running. From December 16th, to the 24th, I installed a 25 and 50 HP stationary electric light plant with 220 volt DC generator at Crofton, Nebraska.

From this time until December 31st, 1916, I was almost continuously with the Sioux City Branch House, installing stationary electric light plants. During this time I installed a plant at Caleridge, Nebraska, complete, building the power house and the pole lines and supervising the wiring of the houses. I installed a city lighting plant at Honesteel, Nebraska, another Winner, South Dakota, power house and pole lines complete, a complete plant at Noville, Iowa, rebuilt the plants at Crofton and Ponca, Nebraska, together with assisting Mr. C. P. Kilbourne, Branch Manager, in the sale of these plants, also a complete power house at Wauconda, South Dakota, where I was fortunate enough to have the ladder break precipitating me into an open exhaust pit and breaking a collar

bone which laid me up for ten days. Also, while putting the plant in at Noville, I started for Correctionville to put in a bid for a power plant there and on the road the auto I was in skidded, the driver lost control and it turned upside down on us in the middle of the road. The injuries received from this accident laid me up for a day. At this time Mr. Johnston had been transferred to the General Office and Mr. MacDonald was promoted to Supt. of Experiments at the Tractor Works. Upon my return Mr. MacDonald informed me that I was to start out on a trip through the territory and teach tractor schools. I informed him that I thought there were more capable men in the organization than I to take care of this work, but he said he had decided for me to do this. Consequently there was no help for it and I started out. I am willing to admit that I had a genuine case of stage fright when I first got up before a bunch of about 150 people in Fort Wayne to lecture, but after I found out that these people were all anxious to learn and nobody seemed to be there to criticize, the work went fairly easy. I lectured at Fort Wayne, Ind., Mason City, Iowa, Omaha, Nebr., Parson, Kansas, Oklahoma City, Okla., and Hutchinson, Kansas, between January 25th and March 21st, 1916, and I don't think that any work I ever did for the company appealed to me as much as this after I had gotten used to it.

On March 26th, 1917 I again returned to Sioux City Iowa and made a complete round of the electric light plants we had installed, returned to Chicago on April 5th, 1917, at which time Mr. Johnston, through recommendation of Mr. MacDonald, made me Manager of Road Engineers in which capacity I am serving the company at the present time.

In conclusion I wish to state that my connection with the company since 1909 has been both pleasant and profitable to myself, and I trust it has been the same to the company.

